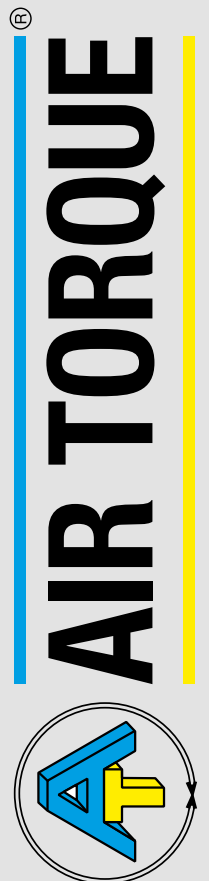


AIR TORQUE HEAVY DUTY AT-HDC COMPACT SERIES

Scotch yoke actuator
“manufactured in Italy”



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Air Torque agents & major stockists Australia, New Zealand & PNG
[Click here for full stock list](#)



DESIGN AND INNOVATION

The Air Torque AT-HDC Heavy Duty Actuators Compact Series is designed for on/off and modulating duties. The AT-HDC Series completes the Air Torque range of the scotch yoke actuators, covering also small and medium valves torques requirements (up to 4.000Nm).

The AT-HDC Series is ready for automation, with all the ancillary attachments in compliance with the international standards. The AT-HDC actuators can be equipped with various accessories and panels directly mounted on board or supplied free standing.

All is completed in the Air Torque factory.

The Air Torque AT-HDC Series incorporates several technical features which make these actuators unique for construction details and functionality properties.

HIGH QUALITY LEVEL PRODUCTION

The AT-HDC Series has been designed to obtain the highest cycling life and the most reliable performance with very reduced maintenance and service.

ROBUST AND INNOVATIVE DESIGN

The AT-HDC Series includes special technical features and materials grade which allows to withstand to the heaviest working conditions.

The unique technical features developed and incorporated in the AT-HDC Series, permits to have the best product for on-off and modulating application, long life expectation and output torques stability for long run.

INTERNATIONAL STANDARD

The AT-HDC Series has been designed, manufactured and tested in Air Torque facilities in full compliance with the latest and most severe applicable International standards.

QUALITY PROVED BY TESTING

Thanks to the recognized know-how, reliability and strong experience in valve automation, Air Torque performs tests in house in order to guarantee compliance with the technical specification related to the quality and reliability of the AT-HDC actuators.

RANGE AND OPTIONS

The AT-HDC Actuator Series is available in:

- Spring return and double acting versions;
- Torque up to 4.000 Nm / 35.400 Lb-In;
- Low, standard and high temperature constructions;
- 90° rotation both in double acting and spring return;
- Fast acting option;
- Hydraulic damper option;
- Manual overrides options.

ACTUATOR OPERATING CONDITIONS

OPERATING MEDIA

Dry or lubricated air, inert/non-corrosive gases or hydraulic oil provided that they are compatible with the internal actuator parts and lubricant.

SUPPLY PRESSURE (For standard actuators)

Pneumatic version: Up to 12 bar / 175 psi

Hydraulic version: Up to 207 bar / 3.000 psi

WORKING TEMPERATURE

| | Pneumatic version: | Hydraulic version: |
|-------------------------------|-------------------------------------|-------------------------------------|
| Standard actuator (S) | -40 °C (-40 °F) to +80 °C (+176 °F) | -30 °C (-22 °F) to +80 °C (+176 °F) |
| High temperature actuator (H) | -15 °C (+5 °F) to +150 °C (+302 °F) | -15 °C (+5 °F) to +110 °C (+230 °F) |
| Low temperature actuator (L) | -60 °C (-76 °F) to +80 °C (+176 °F) | -60 °C (-76 °F) to +80 °C (+176 °F) |

LUBRICATION

Actuators are factory lubricated for life under normal operating conditions.

ACTUATOR DESIGNATION AND MARKING

The actuator selection which reflects the operating conditions and the product designation, is marked on the actuator identification label.

Each single actuator has a QR code marked on the actuator label for easy identification and traciability of the product.

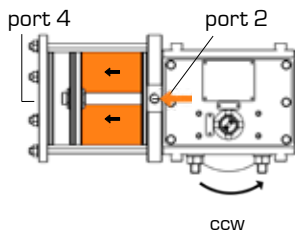
ACTUATOR FUNCTION, ROTATION & TORQUE CURVES

Unless defined, the standard actuator models rotation is clockwise to close.

DOUBLE ACTING ACTUATORS

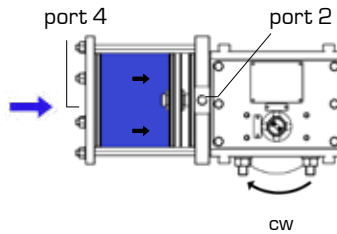
FUNCTIONING (top view)

Port 2 pressurized

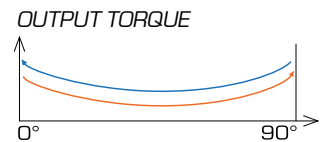


Air supplied to Port 2 forces the piston towards the actuator end flange, exhaust air exits from Port 4.

Port 4 pressurized



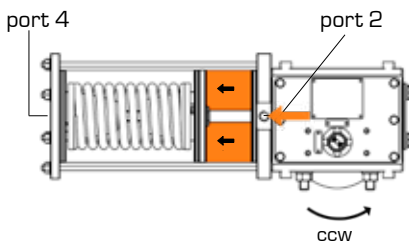
Air supplied to Port 4 forces the piston towards the actuator body, with the exhaust air exiting from Port 2.



SINGLE ACTING ACTUATORS

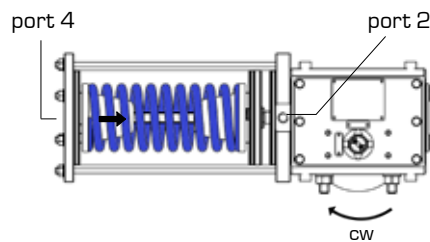
FUNCTIONING (top view)

Port 2 pressurized

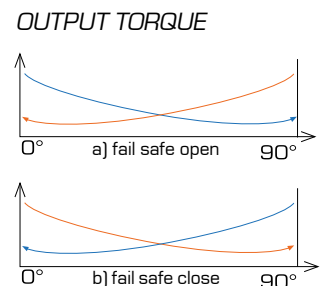


Air supplied to Port 2 forces the piston toward the actuator end flange, compressing the springs, with the exhaust air exiting from Port 4.

Spring released



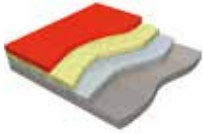
The loss of air pressure (air or electric failure) at Port 2 allows the springs to force the piston inward with the exhaust air exiting from Port 2.



TECHNICAL FEATURES

1. CORROSION PROTECTION

The AT-HDC series is weatherproof. The actuator shaft is offered with coating, adhering to Air Torque's attention to detail commitment maximum level of protection possible. High corrosion resistance material, coupled with multilayer coating of the components, improve the longevity.



2. SELECTED AND HIGH QUALITY BEARINGS AND SEALS

A wide operating temperature range provided with low friction and high cycle life for efficient operation. Bearings on pistons and drive shaft for precise operation, low friction, high cycle life.

8. MODULAR PRELOADED SPRING CARTRIDGES

All the springs in the AT-HDC are coated and preloaded by cartridges.

- Actuator range modularity
- Versatile design
- Highly safer maintenance operation



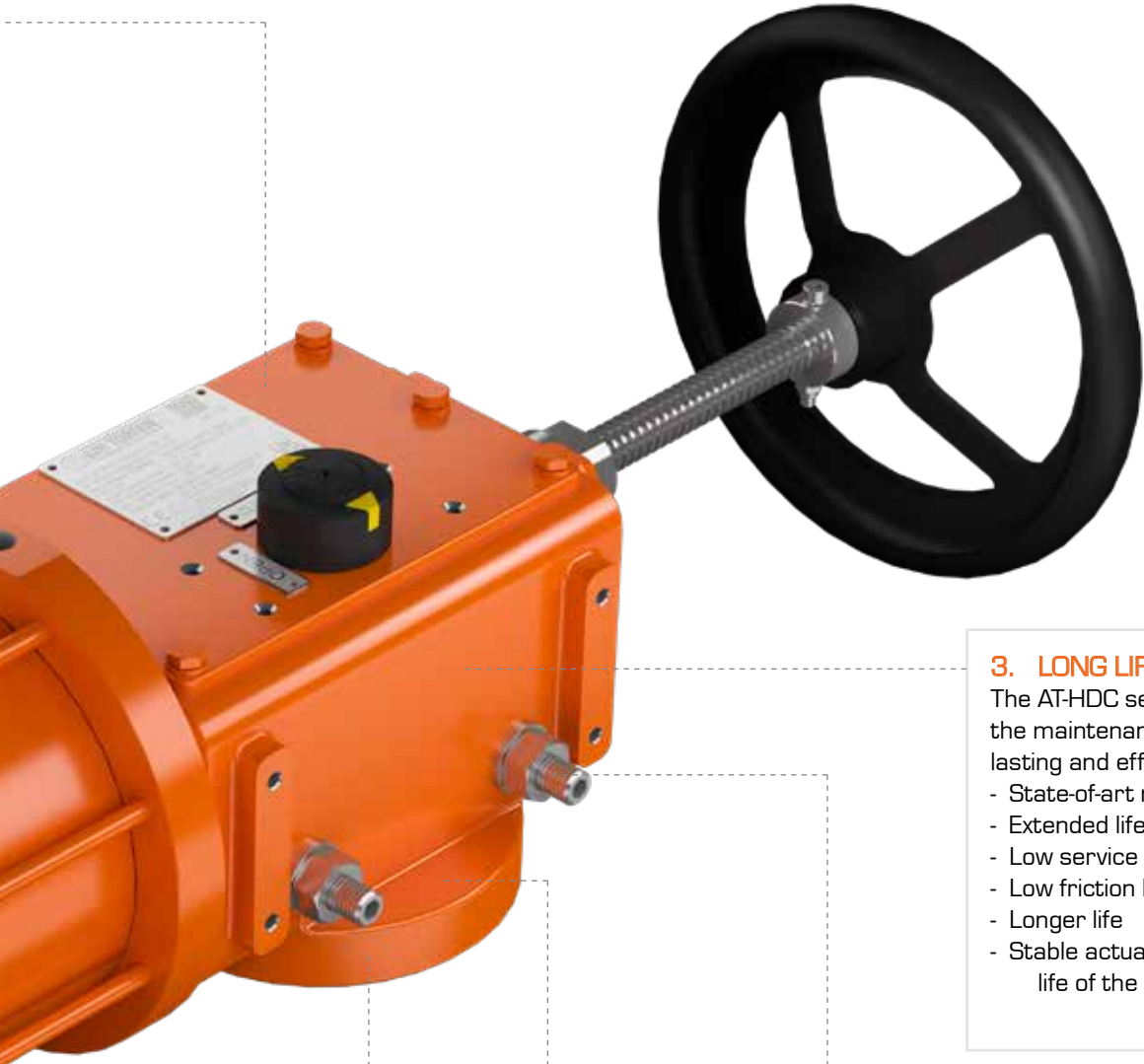
7. GREASED FOR LIFE

The unique design of the scotch yoke mechanism coupled with special grease selection, delivers a long grease retention and less maintenance over the life of the actuator.

6. RELIEF VALVE

Automatic relief valve to discharge excessive or unwanted pressure is a standard component for the AT-HDC Actuators.





3. LONG LIFE - MINIMIZED MAINTENANCE

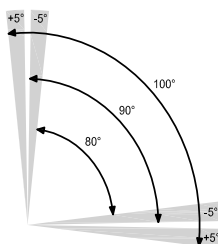
The AT-HDC series is designed to minimize the maintenance frequency and so to provide lasting and efficient performance.

- State-of-art materials and surface treatments
- Extended lifespan
- Low service frequency
- Low friction level
- Longer life
- Stable actuators output torque through the life of the actuator

4. FRONTAL STROKE ADJUSTMENT

The stroke adjustment is possible through screws located in the frontal area of the actuator.

- Simpler stroke adjustment
- Shorter actuator
- Less extended area of potential corrosion



5. FULL COMPLIANCE

Full compliance with ISO 5211, EN 15714-3, VDI/VDE 3845 specifications, providing the product changeability, easiest valve automation and accessories installation.

DIMENSIONS AND TECHNICAL DATA

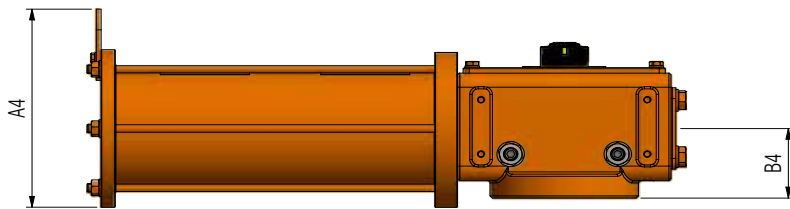
Technical data (Metric Unit - Dimensions in mm)

| ACTUATOR MODEL | ATHDC 035 | | | | | | | | ATHDC 045 | | | | | | | | ATHDC 055 | | | | | | | | ATHDC 065 | | | | | | | |
|------------------------|-----------|------|------|------|------|------|------|------|-----------|------|------|------|------|------|------|------|-----------|------|------|------|------|-------|------|-------|-----------|------|-------|-------|-------|-------|-------|-------|
| | 80 | | 100 | | 125 | | 150 | | 125 | | 150 | | 175 | | 200 | | 175 | | 200 | | 225 | | 250 | | 225 | | 250 | | 280 | | 330 | |
| | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S | D | S |
| A1 | 268 | 402 | 268 | 402 | 268 | 402 | 268 | 402 | 306 | 456 | 306 | 456 | 306 | 456 | 306 | 456 | 390 | 620 | 390 | 620 | 390 | 620 | 390 | 620 | 457 | 726 | 457 | 726 | 457 | 726 | 457 | 726 |
| A2 | 178 | 312 | 178 | 312 | 178 | 312 | 178 | 312 | 203 | 353 | 203 | 353 | 203 | 353 | 203 | 353 | 240 | 472 | 254 | 476 | 254 | 476 | 254 | 476 | 284 | 553 | 284 | 553 | 284 | 553 | 284 | 553 |
| A3 | 130 | 145 | 170 | 195 | 170 | 195 | 170 | 195 | 170 | 195 | 225 | 250 | 232 | 257 | 287 | 315 | 287 | 315 | 287 | 315 | 287 | 315 | 287 | 315 | 287 | 315 | 287 | 315 | 287 | 315 | 287 | 315 |
| A4 | 165 | 183 | 205 | 223 | 205 | 223 | 205 | 223 | 205 | 223 | 263 | 283 | 270 | 295 | 325 | 353 | 270 | 295 | 325 | 353 | 270 | 295 | 325 | 353 | 270 | 295 | 325 | 353 | 270 | 295 | 325 | 353 |
| A5 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| A6 | 163 | 170 | 183 | 195 | 163 | 170 | 183 | 195 | 163 | 170 | 183 | 195 | 163 | 170 | 183 | 195 | 163 | 170 | 183 | 195 | 163 | 170 | 183 | 195 | 163 | 170 | 183 | 195 | 163 | 170 | 183 | 195 |
| A7 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 |
| B1 | 371 | 503 | 371 | 503 | 371 | 503 | 371 | 503 | 421 | 572 | 421 | 572 | 421 | 572 | 421 | 572 | 552 | 785 | 552 | 785 | 552 | 785 | 552 | 785 | 647 | 916 | 647 | 916 | 647 | 916 | 647 | 916 |
| B2 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 | 103 |
| B3 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 63 |
| B4 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 | 64 |
| Q | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 |
| W | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 |
| E | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 |
| F | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| G | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| N | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| P | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| CH | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| Air Volume Opening (l) | 0,46 | 0,73 | 1,15 | 1,66 | 0,46 | 0,73 | 1,15 | 1,66 | 0,46 | 0,73 | 1,15 | 1,66 | 0,46 | 0,73 | 1,15 | 1,66 | 0,46 | 0,73 | 1,15 | 1,66 | 0,46 | 0,73 | 1,15 | 1,66 | 0,46 | 0,73 | 1,15 | 1,66 | 0,46 | 0,73 | 1,15 | 1,66 |
| Air Volume Closing (l) | 0,47 | 0,73 | 1,14 | 1,64 | 0,47 | 0,73 | 1,14 | 1,64 | 0,47 | 0,73 | 1,14 | 1,64 | 0,47 | 0,73 | 1,14 | 1,64 | 0,47 | 0,73 | 1,14 | 1,64 | 0,47 | 0,73 | 1,14 | 1,64 | 0,47 | 0,73 | 1,14 | 1,64 | 0,47 | 0,73 | 1,14 | 1,64 |
| Approx. Weight (kg) | 16,2 | 19,5 | 18,1 | 21,8 | 21,1 | 26,6 | 24,4 | 32,6 | 25,4 | 35,5 | 28,9 | 44,4 | 32,8 | 42,9 | 37,2 | 48,8 | 58,5 | 86,4 | 65,2 | 93,4 | 72,9 | 111,7 | 90,4 | 140,4 | 86,2 | 127 | 105,0 | 155,1 | 112,6 | 164,8 | 131,8 | 187,2 |

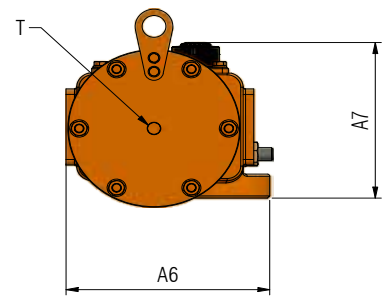
Technical data (Imperial Unit - Dimensions in inch)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|-------|-------|-------|--------|-------|-------|-------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| A1 | 10,55 | 15,83 | 10,55 | 15,83 | 10,55 | 15,83 | 10,55 | 15,83 | 12,05 | 17,95 | 12,05 | 17,95 | 12,05 | 17,95 | 12,05 | 17,95 | 15,35 | 24,41 | 15,35 | 24,41 | 15,35 | 24,41 | 15,35 | 24,41 | 17,99 | 28,58 | 17,99 | 28,58 | 17,99 | 28,58 | 17,99 | 28,58 |
| A2 | 7,01 | 12,28 | 7,01 | 12,28 | 7,01 | 12,28 | 7,01 | 12,28 | 7,99 | 13,90 | 7,99 | 13,90 | 7,99 | 13,90 | 7,99 | 13,90 | 9,45 | 18,58 | 10,00 | 18,74 | 10,00 | 18,74 | 10,00 | 18,74 | 11,18 | 21,77 | 11,18 | 21,77 | 11,18 | 21,77 | 11,18 | 21,77 |
| A3 | 5,12 | 5,70 | 6,69 | 7,68 | 6,69 | 7,68 | 6,69 | 7,68 | 6,69 | 7,68 | 8,86 | 9,84 | 9,13 | 10,12 | 11,30 | 12,40 | 9,13 | 10,12 | 11,30 | 12,40 | 9,13 | 10,12 | 11,30 | 12,40 | 11,29 | 11,75 | 12,75 | 15 | 11,29 | 11,75 | 12,75 | |
| A4 | 6,50 | 7,21 | 8,07 | 8,78 | 8,07 | 8,78 | 8,07 | 8,78 | 8,07 | 8,78 | 10,35 | 11,14 | 10,63 | 11,61 | 12,80 | 13,89 | 10,63 | 11,61 | 12,80 | 13,89 | 10,63 | 11,61 | 12,80 | 13,89 | 12,80 | 13,90 | 14,88 | 17,13 | 12,80 | 13,90 | 14,88 | |
| A5 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | 3,94 | |
| A6 | 6,42 | 6,69 | 7,21 | 7,68 | 6,42 | 6,69 | 7,21 | 7,68 | 6,42 | 6,69 | 7,21 | 7,68 | 6,42 | 6,69 | 7,21 | 7,68 | 6,42 | 6,69 | 7,21 | 7,68 | 6,42 | 6,69 | 7,21 | 7,68 | 6,42 | 6,69 | 7,21 | 7,68 | 6,42 | 6,69 | 7,21 | 7,68 |
| A7 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | 5,63 | |
| B1 | 14,61 | 19,80 | 14,61 | 19,80 | 14,61 | 19,80 | 14,61 | 19,80 | 16,58 | 22,52 | 16,58 | 22,52 | 16,58 | 22,52 | 16,58 | 22,52 | 21,73 | 30,91 | 21,73 | 30,91 | 21,73 | 30,91 | 21,73 | 30,91 | 25,47 | 36,06 | 25,47 | 36,06 | 25,47 | 36,06 | 25,47 | 36,06 |
| B2 | 4,06 | 4,06 | 4,06 | 4,06 | 4,06 | 4,06 | 4,06 | 4,06 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | 4,57 | |
| B3 | 2,48 | 2,48 | 2,48 | 2,48 | 2,48 | 2,48 | 2,48 | 2,48 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | 2,95 | |
| B4 | 2,52 | 2,52 | 2,52 | 2,52 | 2,52 | 2,52 | 2,52 | 2,52 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | 2,76 | |
| Q | 4,02 | 4,02 | 4,02 | 4,02 | 4,02 | 4,02 | 4,02 | 4,02 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | 4,92 | |
| W | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | M12 | |
| E | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | M5 | |
| F | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | 3,15 | |
| G | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | 1,18 | |
| N | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | 0,67 | |
| P | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | 0,79 | |
| CH | 0,87 | 0,87 | 0,87 | 0,87 | 0,87 | 0,87 | 0,87 | 0,87 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | 1,06 | |
| Air Volume Opening (in ³) | 28,07 | 44,55 | 70,18 | 101,30 | 28,07 | 44,55 | 70,18 | 101,30 | 84,82 | 122,66 | 167,20 | 219,08 | 197,72 | 259,35 | 328,31 | 509,55 | 197,72 | 259,35 | 328,31 | 509,55 | 197,72 | 259,35 | 328,31 | 509,55 | 376,52 | 465,61 | 584,00 | 812,23 | 376,52 | 465,61 | 584,00 | |
| Air Volume Closing (in ³) | 28,7 | 44,5 | 69,6 | 100,1 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

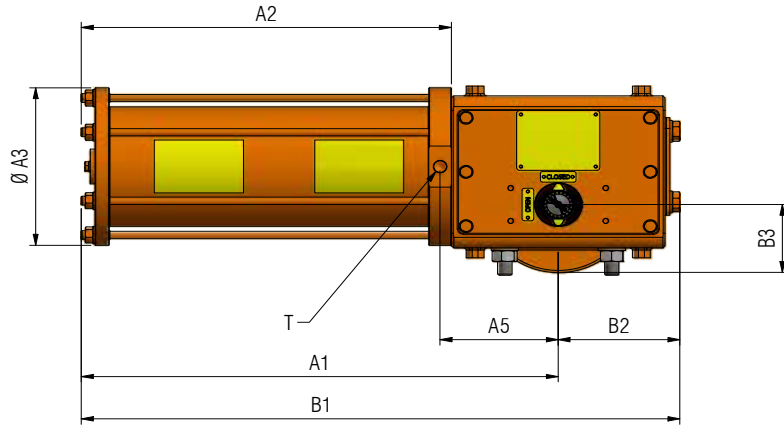
FRONT VIEW



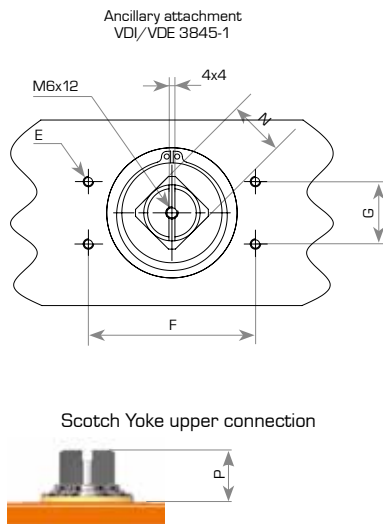
SIDE VIEW



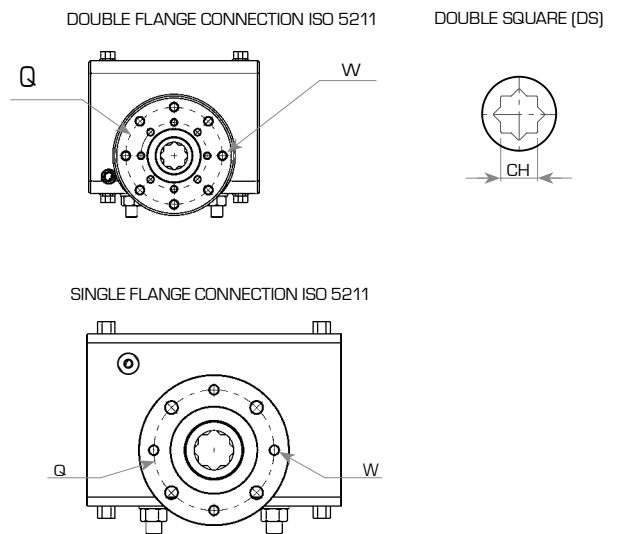
TOP VIEW



ANCILLARY ATTACHMENT



BOTTOM VIEW ISO 5211



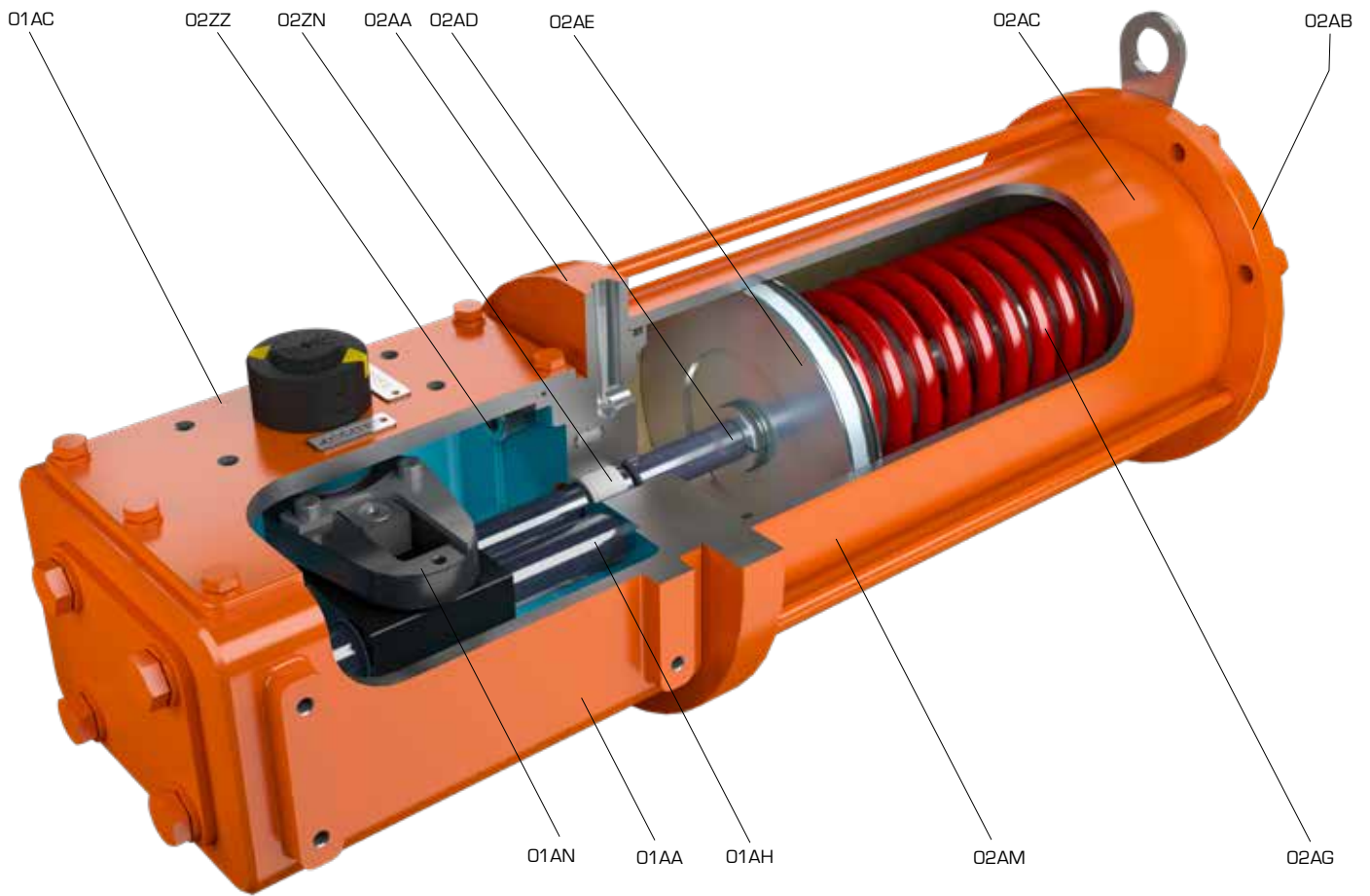
CERTIFICATIONS/COMPLIANCE

Air Torque S.p.A. is fully complying with the standard international requirements.

The management and quality system is certified according to the ISO 9001. Together with this certification the Air Torque complete range of actuators has been awarded with additional approvals and certifications.

- ATEX 2014/34/EU
- SIL3 capable
- EC Declaration of conformity
- IP67 - Degree of protection
- UKSI 2016:1107 Regulation

PARTS AND MATERIALS



| PART N° | PART DESCRIPTION | STANDARD MATERIAL |
|---------|----------------------------------|---------------------|
| 01AA | HOUSING (Central module) | Carbon steel |
| 01AC | COVER (Central module) | Carbon steel |
| 01AH | DRIVE SHAFT | Alloy steel |
| 01AN | SCOTCH YOKE | Carbon steel |
| 02AA | CYLINDER CONNECTION FLANGE | Carbon steel |
| 02AB | END CYLINDER FLANGE | Carbon steel |
| 02AC | CYLINDER | Carbon steel |
| 02AD | PISTON SHAFT | Carbon steel |
| 02AE | PISTON | Carbon steel |
| 02AG | SPRING | Alloy steel |
| 02AM | GASKET (Module) | Syntetyc fibers |
| 02ZN | Sleeve (piston shaft) | High-grade polymers |
| 02ZZ | Screw (Power module connections) | Stainless steel |

PRODUCT OPTIONS

FAST ACTING

for specific applications Air Torque can supply the AT-HDC actuator series with the ability to stroke rapidly (opening and closing)

DEDICATED VALVE INTERFACE

AT-HDC actuators can be supplied with linkage to the valve. As alternative the valve interface of the actuator can be designed specifically to fit the valve top mounting

CONTROL SYSTEMS

The control panels and control systems package is an added value Air Torque can offer. With extensive field experience in valve automation we are able to satisfy almost all the customers requirements.

The AT-HDC actuators can be supplied with control systems sized, designed and manufactured by Air Torque

MANUAL OVERRIDE

Different options are available for emergency operations.

The mechanical manual overrides can be supplied integrated into the actuator design or applied between the actuator and the valve



DECLUTCHABLE GEAR



MANUAL JACKSCREW



MANUAL DECLUTCHABLE JACKSCREW

OUTPUT TORQUE (Nm)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 035 SR - P080 | | AT-HDC 035 SR - P100 | | | | AT-HDC 035 SR - P125 | | | | | AT-HDC 035 SR - P150 | | | |
|-----------------|----------------------|------|----------------------|------|------|------|----------------------|------|------|------|------|----------------------|------|------|------|
| | SC02 | SC04 | SC02 | SC04 | SC06 | SC08 | SC02 | SC04 | SC06 | SC08 | SC10 | SC04 | SC06 | SC08 | SC10 |
| 2,5 bar | Start | | | | | | 109 | 81 | | | | 155 | 105 | | |
| | Run | | | | | | 43 | 21 | | | | 60 | 29 | | |
| | End | | | | | | 69 | 22 | | | | 95 | 31 | | |
| 3 bar | Start | | | 70 | | | 143 | 115 | | | | 203 | 154 | | |
| | Run | | | 23 | | | 60 | 40 | | | | 85 | 55 | | |
| | End | | | 30 | | | 102 | 55 | | | | 144 | 79 | | |
| 3,5 bar | Start | | | 92 | | | 176 | 148 | | | | 252 | 202 | 173 | |
| | Run | | | 34 | | | 77 | 57 | | | | 109 | 79 | 53 | |
| | End | | | 51 | | | 136 | 89 | | | | 192 | 127 | 65 | |
| 4 bar | Start | | | 113 | 85 | | 210 | 182 | 132 | | | 300 | 250 | 221 | |
| | Run | | | 45 | 24 | | 93 | 74 | 44 | | | 133 | 104 | 79 | |
| | End | | | 73 | 26 | | 169 | 122 | 58 | | | 240 | 175 | 114 | |
| 4,5 bar | Start | 65 | | 135 | 107 | | 243 | 215 | 166 | | | 348 | 298 | 269 | 216 |
| | Run | 20 | | 56 | 35 | | 110 | 91 | 61 | | | 157 | 128 | 103 | 63 |
| | End | 25 | | 94 | 47 | | 203 | 156 | 91 | | | 288 | 224 | 162 | 73 |
| 5 bar | Start | 79 | | 156 | 128 | | 277 | 249 | 199 | 170 | | 396 | 347 | 317 | 264 |
| | Run | 27 | | 66 | 46 | | 127 | 107 | 78 | 52 | | 181 | 152 | 128 | 89 |
| | End | 38 | | 116 | 68 | | 236 | 189 | 125 | 63 | | 337 | 272 | 210 | 121 |
| 5,5 bar | Start | 93 | | 177 | 150 | | 310 | 282 | 233 | 204 | | 445 | 395 | 366 | 313 |
| | Run | 34 | | 77 | 57 | | 144 | 124 | 95 | 70 | | 205 | 176 | 152 | 114 |
| | End | 52 | | 137 | 90 | | 270 | 223 | 158 | 96 | | 385 | 320 | 258 | 169 |
| 6 bar | Start | 106 | | 199 | 171 | 122 | 344 | 316 | 266 | 237 | | 493 | 443 | 414 | 361 |
| | Run | 41 | | 88 | 68 | 38 | 160 | 141 | 112 | 87 | | 230 | 201 | 176 | 139 |
| | End | 66 | | 158 | 111 | 47 | 303 | 256 | 192 | 130 | | 433 | 368 | 307 | 218 |
| 6,5 bar | Start | 120 | 92 | 220 | 193 | 143 | 377 | 349 | 300 | 271 | 217 | | 491 | 462 | 409 |
| | Run | 48 | 28 | 99 | 79 | 49 | 177 | 158 | 129 | 104 | 64 | | 225 | 201 | 163 |
| | End | 79 | 32 | 180 | 133 | 68 | 337 | 290 | 225 | 163 | 74 | | 417 | 355 | 266 |
| 7 bar | Start | 134 | 106 | 242 | 214 | 164 | 411 | 383 | 333 | 304 | 251 | | | | 457 |
| | Run | 55 | 35 | 109 | 90 | 60 | 194 | 175 | 145 | 121 | 82 | | | | 187 |
| | End | 93 | 46 | 201 | 154 | 90 | 370 | 323 | 259 | 197 | 108 | | | | 314 |
| 7,5 bar | Start | 147 | 120 | 263 | 236 | 186 | 444 | 416 | 367 | 338 | 284 | | | | |
| | Run | 62 | 42 | 120 | 101 | 71 | 211 | 191 | 162 | 138 | 100 | | | | |
| | End | 107 | 60 | 223 | 176 | 111 | 404 | 357 | 292 | 230 | 141 | | | | |
| 8 bar | Start | 161 | 133 | 285 | 257 | 207 | 478 | 450 | 400 | 371 | 318 | | | | |
| | Run | 69 | 49 | 131 | 111 | 82 | 228 | 208 | 179 | 155 | 117 | | | | |
| | End | 121 | 74 | 244 | 197 | 133 | 437 | 390 | 326 | 264 | 175 | | | | |
| 8,5 bar | Start | 175 | 147 | 306 | 278 | 229 | 511 | 483 | 434 | 405 | 351 | | | | |
| | Run | 76 | 56 | 142 | 122 | 93 | 225 | 196 | 172 | 134 | | | | | |
| | End | 134 | 87 | 266 | 219 | 154 | 424 | 359 | 297 | 208 | | | | | |
| 9 bar | Start | 189 | 161 | 328 | 300 | 250 | 544 | 516 | 467 | 438 | 385 | | | | |
| | Run | 83 | 63 | 152 | 133 | 104 | 231 | 202 | 173 | 135 | | | | | |
| | End | 148 | 101 | 287 | 240 | 175 | 437 | 393 | 331 | 242 | | | | | |
| 9,5 bar | Start | 202 | 175 | 349 | 321 | 272 | 577 | 549 | 500 | 471 | 418 | | | | |
| | Run | 90 | 70 | 163 | 144 | 114 | 234 | 205 | 176 | 136 | | | | | |
| | End | 162 | 115 | 308 | 261 | 197 | 437 | 394 | 332 | 245 | | | | | |
| 10 bar | Start | 216 | 188 | 370 | 343 | 293 | 609 | 581 | 532 | 503 | 452 | | | | |
| | Run | 97 | 77 | 174 | 154 | 125 | 237 | 208 | 179 | 139 | | | | | |
| | End | 176 | 129 | 330 | 283 | 218 | 437 | 394 | 332 | 245 | | | | | |
| 10,5 bar | Start | 230 | 202 | 392 | 364 | 315 | 642 | 614 | 565 | 536 | 485 | | | | |
| | Run | 103 | 84 | 185 | 165 | 136 | 240 | 211 | 182 | 142 | | | | | |
| | End | 189 | 142 | 351 | 304 | 240 | 437 | 394 | 332 | 245 | | | | | |
| 11 bar | Start | 244 | 216 | 413 | 386 | 336 | 674 | 646 | 597 | 568 | 517 | | | | |
| | Run | 110 | 91 | 195 | 176 | 147 | 243 | 214 | 185 | 145 | | | | | |
| | End | 203 | 156 | 373 | 326 | 261 | 437 | 394 | 332 | 245 | | | | | |
| 11,5 bar | Start | 257 | 230 | 435 | 407 | 357 | 706 | 678 | 629 | 600 | 549 | | | | |
| | Run | 117 | 98 | 206 | 187 | 158 | 246 | 217 | 188 | 148 | | | | | |
| | End | 217 | 170 | 394 | 347 | 283 | 437 | 394 | 332 | 245 | | | | | |
| 12 bar | Start | 271 | 243 | 456 | 428 | 379 | 738 | 710 | 661 | 632 | 581 | | | | |
| | Run | 124 | 105 | 217 | 197 | 168 | 249 | 220 | 191 | 151 | | | | | |
| | End | 230 | 183 | 416 | 369 | 304 | 437 | 394 | 332 | 245 | | | | | |
| Spring | Start | 99 | 146 | 99 | 146 | 211 | 99 | 146 | 211 | 272 | 361 | 146 | 211 | 272 | 361 |
| | Run | 40 | 59 | 40 | 59 | 88 | 40 | 59 | 88 | 110 | 146 | 59 | 88 | 110 | 146 |
| | End | 58 | 86 | 58 | 86 | 136 | 58 | 86 | 136 | 165 | 218 | 86 | 136 | 165 | 218 |

OUTPUT TORQUE (Nm)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 045 SR - P125 | | | AT-HDC 045 SR - P150 | | | | | AT-HDC 045 SR - P175 | | | | | AT-HDC 045 SR - P200 | | | | | |
|-----------------|----------------------|------|------|----------------------|------|------|------|------|----------------------|------|------|------|------|----------------------|------|------|------|------|-----|
| | SC02 | SC04 | SC06 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | |
| 2,5 bar | Start | | | | | | | | 197 | | | | | 326 | 275 | | | | |
| | Run | | | | | | | | 56 | | | | | 123 | 85 | | | | |
| | End | | | | | | | | 61 | | | | | 190 | 104 | | | | |
| 3 bar | Start | | | | | | | | 282 | | | | | 437 | 385 | 322 | | | |
| | Run | | | | | | | | 100 | | | | | 179 | 142 | 98 | | | |
| | End | | | | | | | | 146 | | | | | 301 | 214 | 118 | | | |
| 3,5 bar | Start | | | | 209 | | | | 366 | 314 | | | | 547 | 495 | 432 | 368 | | |
| | Run | | | | 62 | | | | 143 | 106 | | | | 235 | 198 | 156 | 111 | | |
| | End | | | | 73 | | | | 230 | 144 | | | | 411 | 325 | 228 | 133 | | |
| 4 bar | Start | | | | 271 | | | | 451 | 399 | 336 | | | 657 | 606 | 543 | 478 | 423 | |
| | Run | | | | 95 | | | | 186 | 149 | 105 | | | 290 | 254 | 212 | 169 | 118 | |
| | End | | | | 135 | | | | 314 | 228 | 131 | | | 521 | 435 | 338 | 243 | 126 | |
| 4,5 bar | Start | | | | 333 | 282 | | | 535 | 483 | 420 | 356 | | 768 | 716 | 653 | 589 | 534 | |
| | Run | | | | 127 | 89 | | | 229 | 192 | 149 | 105 | | 345 | 309 | 268 | 226 | 177 | |
| | End | | | | 197 | 111 | | | 399 | 313 | 216 | 121 | | 631 | 545 | 449 | 353 | 236 | |
| 5 bar | Start | 206 | | | 395 | 344 | 281 | | 619 | 568 | 505 | 440 | | 878 | 826 | 763 | 699 | 644 | |
| | Run | 61 | | | 158 | 121 | 75 | | 271 | 235 | 193 | 150 | | 401 | 365 | 323 | 281 | 234 | |
| | End | 70 | | | 259 | 173 | 76 | | 483 | 397 | 300 | 205 | | 742 | 655 | 559 | 464 | 347 | |
| 5,5 bar | Start | 249 | | | 457 | 406 | 343 | | 704 | 652 | 589 | 525 | 470 | 988 | 936 | 873 | 809 | 754 | |
| | Run | 83 | | | 190 | 153 | 109 | | 313 | 277 | 235 | 193 | 143 | 456 | 420 | 379 | 337 | 290 | |
| | End | 113 | | | 321 | 235 | 138 | | 568 | 481 | 385 | 290 | 173 | 852 | 766 | 669 | 574 | 457 | |
| 6 bar | Start | 292 | 240 | | 519 | 468 | 405 | 340 | 788 | 737 | 673 | 609 | 554 | | | 984 | 919 | 865 | |
| | Run | 106 | 66 | | 221 | 184 | 141 | 96 | 356 | 320 | 278 | 236 | 188 | | | 434 | 393 | 346 | |
| | End | 156 | 70 | | 383 | 297 | 200 | 105 | 652 | 566 | 469 | 374 | 257 | | | 779 | 684 | 567 | |
| 6,5 bar | Start | 335 | 283 | | 581 | 530 | 467 | 402 | 873 | 821 | 758 | 694 | 639 | | | | | 975 | |
| | Run | 128 | 90 | | 252 | 216 | 173 | 130 | 398 | 362 | 321 | 279 | 232 | | | | | 402 | |
| | End | 199 | 113 | | 445 | 359 | 262 | 167 | 737 | 650 | 554 | 458 | 342 | | | | | 678 | |
| 7 bar | Start | 378 | 327 | | 643 | 592 | 529 | 464 | 957 | 905 | 842 | 778 | 723 | | | | | | |
| | Run | 150 | 112 | | 283 | 247 | 205 | 162 | 440 | 404 | 363 | 321 | 275 | | | | | | |
| | End | 242 | 156 | | 507 | 421 | 324 | 229 | 821 | 735 | 638 | 543 | 426 | | | | | | |
| 7,5 bar | Start | 421 | 370 | 306 | 706 | 654 | 591 | 527 | 472 | | 990 | 927 | 862 | 808 | | | | | |
| | Run | 171 | 134 | 89 | 314 | 278 | 236 | 194 | 144 | | 447 | 405 | 364 | 318 | | | | | |
| | End | 285 | 199 | 102 | 569 | 483 | 386 | 291 | 174 | | 819 | 722 | 627 | 510 | | | | | |
| 8 bar | Start | 464 | 413 | 350 | 768 | 716 | 653 | 589 | 534 | | | 947 | 892 | | | | | | |
| | Run | 193 | 156 | 113 | 345 | 309 | 268 | 226 | 177 | | | 406 | 360 | | | | | | |
| | End | 328 | 242 | 145 | 631 | 545 | 449 | 353 | 236 | | | 712 | 595 | | | | | | |
| 8,5 bar | Start | 507 | 456 | 393 | 830 | 778 | 715 | 651 | 596 | | | | 977 | | | | | | |
| | Run | 215 | 178 | 135 | 376 | 341 | 299 | 257 | 209 | | | | 403 | | | | | | |
| | End | 371 | 285 | 188 | 693 | 607 | 511 | 415 | 299 | | | | 679 | | | | | | |
| 9 bar | Start | 550 | 499 | 436 | 892 | 840 | 777 | 713 | 658 | | | | | | | | | | |
| | Run | 236 | 200 | 157 | 408 | 372 | 330 | 288 | 241 | | | | | | | | | | |
| | End | 414 | 328 | 231 | 755 | 669 | 573 | 477 | 361 | | | | | | | | | | |
| 9,5 bar | Start | 594 | 542 | 479 | 954 | 902 | 839 | 775 | 720 | | | | | | | | | | |
| | Run | 258 | 222 | 179 | 439 | 403 | 361 | 320 | 273 | | | | | | | | | | |
| | End | 457 | 371 | 274 | 818 | 731 | 635 | 539 | 423 | | | | | | | | | | |
| 10 bar | Start | 637 | 585 | 522 | | 964 | 901 | 837 | 782 | | | | | | | | | | |
| | Run | 280 | 243 | 201 | | 434 | 392 | 351 | 304 | | | | | | | | | | |
| | End | 500 | 414 | 318 | | 793 | 697 | 601 | 485 | | | | | | | | | | |
| 10,5 bar | Start | 680 | 628 | 565 | | | 963 | 899 | 844 | | | | | | | | | | |
| | Run | 301 | 265 | 223 | | | 424 | 382 | 336 | | | | | | | | | | |
| | End | 544 | 457 | 361 | | | 759 | 663 | 547 | | | | | | | | | | |
| 11 bar | Start | 723 | 671 | 608 | | | | 961 | 906 | | | | | | | | | | |
| | Run | 323 | 287 | 245 | | | | 413 | 367 | | | | | | | | | | |
| | End | 587 | 500 | 404 | | | | 725 | 609 | | | | | | | | | | |
| 11,5 bar | Start | 766 | 714 | 651 | | | | | 968 | | | | | | | | | | |
| | Run | 344 | 308 | 267 | | | | | 398 | | | | | | | | | | |
| | End | 630 | 543 | 447 | | | | | 671 | | | | | | | | | | |
| 12 bar | Start | 809 | 757 | 694 | | | | | | | | | | | | | | | |
| | Run | 366 | 330 | 288 | | | | | | | | | | | | | | | |
| | End | 673 | 586 | 490 | | | | | | | | | | | | | | | |
| Spring | Start | 361 | 447 | 544 | 361 | 447 | 544 | 639 | 756 | 361 | 447 | 544 | 639 | 756 | 361 | 447 | 544 | 639 | 756 |
| | Run | 148 | 183 | 223 | 148 | 183 | 223 | 264 | 307 | 148 | 183 | 223 | 264 | 307 | 148 | 183 | 223 | 264 | 307 |
| | End | 225 | 277 | 340 | 225 | 277 | 340 | 404 | 459 | 225 | 277 | 340 | 404 | 459 | 225 | 277 | 340 | 404 | 459 |

OUTPUT TORQUE (Nm)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 055 SR - P175 | | | AT-HDC 055 SR - P200 | | | | | AT-HDC 055 SR - P225 | | | | | AT-HDC 055 SR - P250 | | | | |
|-----------------|----------------------|-------|-------|----------------------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|
| | SC02 | SC04 | SC06 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | SC04 | SC06 | SC08 | SC10 | |
| 2,5 bar | Start | | | 331 | | | | | 510 | 406 | | | | 606 | | | | |
| | Run | | | 96 | | | | | 190 | 112 | | | | 218 | | | | |
| | End | | | 110 | | | | | 289 | 119 | | | | 319 | | | | |
| 3 bar | Start | | | 465 | | | | | 680 | 576 | | | | 817 | 680 | | | |
| | Run | | | 167 | | | | | 277 | 203 | | | | 325 | 227 | | | |
| | End | | | 245 | | | | | 460 | 289 | | | | 529 | 306 | | | |
| 3,5 bar | Start | 379 | | 600 | 496 | | | | 851 | 747 | 611 | | | 1.027 | 891 | | | |
| | Run | 123 | | 236 | 161 | | | | 362 | 290 | 190 | | | 431 | 336 | | | |
| | End | 158 | | 380 | 209 | | | | 630 | 460 | 236 | | | 740 | 516 | | | |
| 4 bar | Start | 482 | | 735 | 631 | | | | 1.021 | 918 | 781 | | | 1.238 | 1.102 | 850 | | |
| | Run | 176 | | 304 | 231 | | | | 448 | 376 | 280 | | | 537 | 442 | 262 | | |
| | End | 262 | | 514 | 344 | | | | 801 | 630 | 407 | | | 950 | 727 | 321 | | |
| 4,5 bar | Start | 585 | 482 | 870 | 766 | 630 | | | 1.192 | 1.088 | 952 | | | 1.448 | 1.312 | 1.061 | 925 | |
| | Run | 229 | 153 | 372 | 299 | 201 | | | 534 | 462 | 367 | | | 643 | 549 | 373 | 270 | |
| | End | 365 | 194 | 649 | 479 | 255 | | | 971 | 801 | 577 | | | 1.161 | 937 | 532 | 308 | |
| 5 bar | Start | 689 | 585 | 1.005 | 901 | 765 | | | 1.362 | 1.259 | 1.123 | 871 | | 1.659 | 1.523 | 1.272 | 1.135 | |
| | Run | 281 | 207 | 440 | 368 | 271 | | | 619 | 548 | 453 | 274 | | 748 | 655 | 481 | 382 | |
| | End | 468 | 298 | 784 | 614 | 390 | | | 1.142 | 972 | 748 | 342 | | 1.372 | 1.148 | 742 | 519 | |
| 5,5 bar | Start | 792 | 688 | 552 | 1.139 | 1.036 | 899 | | 1.533 | 1.429 | 1.293 | 1.042 | 906 | 1.869 | 1.733 | 1.482 | 1.346 | |
| | Run | 333 | 260 | 158 | 507 | 436 | 340 | | 705 | 633 | 539 | 363 | 259 | 854 | 760 | 588 | 491 | |
| | End | 571 | 401 | 177 | 919 | 748 | 525 | | 1.312 | 1.142 | 918 | 513 | 289 | 1.582 | 1.358 | 953 | 729 | |
| 6 bar | Start | 895 | 791 | 655 | 1.274 | 1.170 | 1.034 | 783 | 1.704 | 1.600 | 1.464 | 1.213 | 1.076 | | 1.944 | 1.693 | 1.557 | |
| | Run | 385 | 312 | 214 | 575 | 503 | 408 | 226 | 790 | 719 | 625 | 451 | 351 | | 866 | 694 | 598 | |
| | End | 674 | 504 | 280 | 1.053 | 883 | 659 | 254 | 1.483 | 1.313 | 1.089 | 683 | 460 | | 1.569 | 1.164 | 940 | |
| 6,5 bar | Start | 998 | 894 | 758 | 1.409 | 1.305 | 1.169 | 918 | 1.874 | 1.770 | 1.634 | 1.383 | 1.247 | | | 1.903 | 1.767 | |
| | Run | 436 | 364 | 268 | 642 | 571 | 476 | 298 | 875 | 804 | 711 | 538 | 440 | | | 800 | 705 | |
| | End | 778 | 607 | 383 | 1.188 | 1.018 | 794 | 389 | 1.654 | 1.483 | 1.260 | 854 | 630 | | | 1.374 | 1.150 | |
| 7 bar | Start | 1.101 | 998 | 861 | 1.544 | 1.440 | 1.304 | 1.053 | 916 | | 1.941 | 1.805 | 1.554 | 1.418 | | | 1.978 | |
| | Run | 488 | 416 | 321 | 710 | 639 | 544 | 369 | 265 | | 890 | 796 | 624 | 527 | | | 811 | |
| | End | 881 | 710 | 487 | 1.323 | 1.153 | 929 | 523 | 300 | | 1.654 | 1.430 | 1.025 | 801 | | | 1.361 | |
| 7,5 bar | Start | 1.205 | 1.101 | 965 | 1.678 | 1.575 | 1.438 | 1.187 | 1.051 | | | 1.975 | 1.724 | 1.588 | | | | |
| | Run | 540 | 468 | 373 | 777 | 706 | 612 | 438 | 338 | | | 882 | 710 | 614 | | | | |
| | End | 984 | 814 | 590 | 1.458 | 1.287 | 1.064 | 658 | 434 | | | 1.601 | 1.195 | 971 | | | | |
| 8 bar | Start | 1.308 | 1.204 | 1.068 | 1.813 | 1.709 | 1.573 | 1.322 | 1.186 | | | | 1.895 | 1.759 | | | | |
| | Run | 592 | 520 | 425 | 845 | 774 | 680 | 507 | 408 | | | | 796 | 701 | | | | |
| | End | 1.087 | 917 | 693 | 1.593 | 1.422 | 1.198 | 793 | 569 | | | | 1.366 | 1.142 | | | | |
| 8,5 bar | Start | 1.411 | 1.307 | 1.171 | 1.948 | 1.844 | 1.708 | 1.457 | 1.321 | | | | | 1.929 | | | | |
| | Run | 643 | 572 | 478 | 912 | 841 | 748 | 575 | 478 | | | | | 787 | | | | |
| | End | 1.190 | 1.020 | 796 | 1.727 | 1.557 | 1.333 | 928 | 704 | | | | | 1.313 | | | | |
| 9 bar | Start | 1.514 | 1.410 | 1.274 | | 1.979 | 1.843 | 1.592 | 1.455 | | | | | | | | | |
| | Run | 695 | 624 | 530 | | 909 | 815 | 643 | 547 | | | | | | | | | |
| | End | 1.294 | 1.123 | 899 | | 1.692 | 1.468 | 1.062 | 839 | | | | | | | | | |
| 9,5 bar | Start | 1.617 | 1.514 | 1.377 | | | 1.978 | 1.726 | 1.590 | | | | | | | | | |
| | Run | 747 | 676 | 582 | | | 883 | 711 | 615 | | | | | | | | | |
| | End | 1.397 | 1.226 | 1.003 | | | 1.603 | 1.197 | 974 | | | | | | | | | |
| 10 bar | Start | 1.720 | 1.617 | 1.481 | | | | 1.861 | 1.725 | | | | | | | | | |
| | Run | 798 | 727 | 633 | | | | 779 | 684 | | | | | | | | | |
| | End | 1.500 | 1.330 | 1.106 | | | | 1.332 | 1.108 | | | | | | | | | |
| 10,5 bar | Start | 1.824 | 1.720 | 1.584 | | | | 1.996 | 1.860 | | | | | | | | | |
| | Run | 850 | 779 | 685 | | | | 847 | 752 | | | | | | | | | |
| | End | 1.603 | 1.433 | 1.209 | | | | 1.467 | 1.243 | | | | | | | | | |
| 11 bar | Start | 1.927 | 1.823 | 1.687 | | | | | 1.995 | | | | | | | | | |
| | Run | 902 | 831 | 737 | | | | | 820 | | | | | | | | | |
| | End | 1.706 | 1.536 | 1.312 | | | | | 1.378 | | | | | | | | | |
| 11,5 bar | Start | | 1.926 | 1.790 | | | | | | | | | | | | | | |
| | Run | | 882 | 789 | | | | | | | | | | | | | | |
| | End | | 1.639 | 1.415 | | | | | | | | | | | | | | |
| 12 bar | Start | | | 1.893 | | | | | | | | | | | | | | |
| | Run | | | 841 | | | | | | | | | | | | | | |
| | End | | | 1.519 | | | | | | | | | | | | | | |
| Spring | Start | 564 | 734 | 958 | 564 | 734 | 958 | 1.363 | 1.587 | 564 | 734 | 958 | 1.363 | 1.587 | 734 | 958 | 1.363 | 1.587 |
| | Run | 229 | 298 | 389 | 229 | 298 | 389 | 555 | 646 | 229 | 298 | 389 | 555 | 646 | 298 | 389 | 555 | 646 |
| | End | 343 | 447 | 583 | 343 | 447 | 583 | 834 | 970 | 343 | 447 | 583 | 834 | 970 | 447 | 583 | 834 | 970 |

OUTPUT TORQUE (Nm)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 065 SR - P225 | | | AT-HDC 065 SR - P250 | | | | | AT-HDC 065 SR - P280 | | | | | AT-HDC 065 SR - P330 | | | | |
|-----------------|----------------------|-------|-------|----------------------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|
| | SC02 | SC04 | SC06 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | SC04 | SC06 | SC08 | SC10 | |
| 2,5 bar | Start | | | 674 | | | | | 991 | 750 | | | | 1.357 | 1.093 | | | |
| | Run | | | 239 | | | | | 400 | 230 | | | | 543 | 358 | | | |
| | End | | | 345 | | | | | 662 | 281 | | | | 888 | 471 | | | |
| 3 bar | Start | 640 | | 923 | 682 | | | | 1.303 | 1.062 | | | | 1.790 | 1.526 | 1.202 | | |
| | Run | 221 | | 366 | 193 | | | | 558 | 393 | | | | 761 | 581 | 348 | | |
| | End | 310 | | 594 | 213 | | | | 974 | 593 | | | | 1.322 | 905 | 394 | | |
| 3,5 bar | Start | 841 | | 1.172 | 931 | | | | 1.615 | 1.374 | 1.110 | | | 2.224 | 1.960 | 1.636 | | |
| | Run | 325 | | 492 | 326 | | | | 714 | 551 | 367 | | | 979 | 801 | 577 | | |
| | End | 512 | | 843 | 462 | | | | 1.286 | 905 | 488 | | | 1.755 | 1.339 | 827 | | |
| 4 bar | Start | 1.043 | 801 | 1.421 | 1.180 | 916 | | | 1.928 | 1.686 | 1.422 | | | 2.658 | 2.394 | 2.070 | 1.704 | |
| | Run | 427 | 258 | 617 | 453 | 263 | | | 871 | 709 | 528 | | | 1.197 | 1.019 | 799 | 540 | |
| | End | 713 | 332 | 1.092 | 711 | 294 | | | 1.598 | 1.217 | 801 | | | 2.189 | 1.772 | 1.261 | 684 | |
| 4,5 bar | Start | 1.244 | 1.003 | 1.670 | 1.428 | 1.164 | | | 2.240 | 1.998 | 1.734 | 1.410 | | 3.091 | 2.827 | 2.503 | 2.137 | |
| | Run | 528 | 363 | 742 | 579 | 396 | | | 1.027 | 866 | 687 | 460 | | 1.414 | 1.237 | 1.019 | 766 | |
| | End | 915 | 534 | 1.341 | 960 | 543 | | | 1.910 | 1.529 | 1.113 | 602 | | 2.623 | 2.206 | 1.695 | 1.117 | |
| 5 bar | Start | 1.446 | 1.205 | 940 | 1.919 | 1.677 | 1.413 | 1.089 | 2.552 | 2.311 | 2.046 | 1.722 | 1.357 | 3.525 | 3.261 | 2.937 | 2.571 | |
| | Run | 629 | 466 | 277 | 867 | 704 | 524 | 281 | 1.184 | 1.022 | 845 | 622 | 336 | 1.631 | 1.455 | 1.237 | 988 | |
| | End | 1.117 | 736 | 319 | 1.589 | 1.209 | 792 | 281 | 2.223 | 1.842 | 1.425 | 914 | 336 | 3.056 | 2.640 | 2.128 | 1.551 | |
| 5,5 bar | Start | 1.648 | 1.406 | 1.142 | 2.168 | 1.926 | 1.662 | 1.338 | 2.864 | 2.623 | 2.359 | 2.035 | 1.669 | 3.959 | 3.695 | 3.371 | 3.005 | |
| | Run | 731 | 568 | 384 | 991 | 830 | 650 | 422 | 1.340 | 1.179 | 1.002 | 781 | 522 | 1.848 | 1.672 | 1.455 | 1.207 | |
| | End | 1.318 | 937 | 521 | 1.838 | 1.457 | 1.041 | 530 | 2.535 | 2.154 | 1.737 | 1.226 | 649 | 3.490 | 3.073 | 2.562 | 1.985 | |
| 6 bar | Start | 1.849 | 1.608 | 1.344 | 2.417 | 2.175 | 1.911 | 1.587 | 3.176 | 2.935 | 2.671 | 2.347 | 1.981 | | | 3.804 | 3.438 | |
| | Run | 832 | 669 | 488 | 1.116 | 955 | 776 | 552 | 1.496 | 1.336 | 1.159 | 939 | 686 | | | 1.673 | 1.426 | |
| | End | 1.520 | 1.139 | 722 | 2.087 | 1.706 | 1.290 | 778 | 2.847 | 2.466 | 2.049 | 1.538 | 961 | | | 2.996 | 2.418 | |
| 6,5 bar | Start | 2.051 | 1.809 | 1.545 | 2.665 | 2.424 | 2.160 | 1.836 | 3.488 | 3.247 | 2.983 | 2.659 | 2.293 | | | | 3.872 | |
| | Run | 933 | 771 | 591 | 1.240 | 1.079 | 902 | 680 | 1.652 | 1.492 | 1.315 | 1.097 | 846 | | | | 1.645 | |
| | End | 1.721 | 1.340 | 924 | 2.336 | 1.955 | 1.538 | 1.027 | 3.159 | 2.778 | 2.362 | 1.850 | 1.273 | | | | 2.852 | |
| 7 bar | Start | 2.252 | 2.011 | 1.747 | 2.914 | 2.673 | 2.409 | 2.085 | 3.801 | 3.559 | 3.295 | 2.971 | 2.605 | | | | | |
| | Run | 1.034 | 872 | 693 | 1.365 | 1.204 | 1.027 | 807 | 1.808 | 1.648 | 1.472 | 1.254 | 1.005 | | | | | |
| | End | 1.923 | 1.542 | 1.125 | 2.585 | 2.204 | 1.787 | 1.276 | 3.471 | 3.090 | 2.674 | 2.163 | 1.585 | | | | | |
| 7,5 bar | Start | 2.454 | 2.212 | 1.948 | 3.163 | 2.922 | 2.658 | 2.334 | | 3.871 | 3.607 | 3.283 | 2.917 | | | | | |
| | Run | 1.135 | 973 | 795 | 1.490 | 1.329 | 1.152 | 933 | 679 | | 1.804 | 1.628 | 1.411 | 1.163 | | | | |
| | End | 2.125 | 1.744 | 1.327 | 2.834 | 2.453 | 2.036 | 1.525 | 948 | | 3.403 | 2.986 | 2.475 | 1.897 | | | | |
| 8 bar | Start | 2.655 | 2.414 | 2.150 | 3.412 | 3.171 | 2.907 | 2.583 | 2.217 | | 3.920 | 3.596 | 3.230 | | | | | |
| | Run | 1.235 | 1.074 | 897 | 1.614 | 1.454 | 1.277 | 1.059 | 807 | | 1.785 | 1.568 | 1.321 | | | | | |
| | End | 2.326 | 1.945 | 1.529 | 3.083 | 2.702 | 2.285 | 1.774 | 1.197 | | 3.298 | 2.787 | 2.210 | | | | | |
| 8,5 bar | Start | 2.857 | 2.616 | 2.352 | 3.661 | 3.419 | 3.155 | 2.831 | 2.466 | | | 3.908 | 3.542 | | | | | |
| | Run | 1.336 | 1.175 | 998 | 1.739 | 1.578 | 1.402 | 1.184 | 934 | | | 1.725 | 1.478 | | | | | |
| | End | 2.528 | 2.147 | 1.730 | 3.332 | 2.951 | 2.534 | 2.023 | 1.445 | | | 3.099 | 2.522 | | | | | |
| 9 bar | Start | 3.059 | 2.817 | 2.553 | 3.910 | 3.668 | 3.404 | 3.080 | 2.714 | | | | 3.854 | | | | | |
| | Run | 1.437 | 1.277 | 1.100 | 1.863 | 1.703 | 1.527 | 1.309 | 1.061 | | | | 1.636 | | | | | |
| | End | 2.729 | 2.348 | 1.932 | 3.580 | 3.200 | 2.783 | 2.272 | 1.694 | | | | 2.834 | | | | | |
| 9,5 bar | Start | 3.260 | 3.019 | 2.755 | | 3.917 | 3.653 | 3.329 | 2.963 | | | | | | | | | |
| | Run | 1.538 | 1.378 | 1.201 | | 1.827 | 1.651 | 1.434 | 1.187 | | | | | | | | | |
| | End | 2.931 | 2.550 | 2.133 | | 3.448 | 3.032 | 2.521 | 1.943 | | | | | | | | | |
| 10 bar | Start | 3.462 | 3.220 | 2.956 | | | 3.902 | 3.578 | 3.212 | | | | | | | | | |
| | Run | 1.639 | 1.478 | 1.302 | | | 1.776 | 1.559 | 1.312 | | | | | | | | | |
| | End | 3.132 | 2.752 | 2.335 | | | 3.281 | 2.769 | 2.192 | | | | | | | | | |
| 10,5 bar | Start | 3.663 | 3.422 | 3.158 | | | | 3.827 | 3.461 | | | | | | | | | |
| | Run | 1.740 | 1.579 | 1.403 | | | | 1.684 | 1.438 | | | | | | | | | |
| | End | 3.334 | 2.953 | 2.536 | | | | 3.018 | 2.441 | | | | | | | | | |
| 11 bar | Start | 3.865 | 3.624 | 3.359 | | | | | 3.710 | | | | | | | | | |
| | Run | 1.841 | 1.680 | 1.504 | | | | | 1.563 | | | | | | | | | |
| | End | 3.536 | 3.155 | 2.738 | | | | | 2.690 | | | | | | | | | |
| 11,5 bar | Start | | 3.825 | 3.561 | | | | | 3.959 | | | | | | | | | |
| | Run | | 1.781 | 1.605 | | | | | 1.688 | | | | | | | | | |
| | End | | 3.356 | 2.940 | | | | | 2.939 | | | | | | | | | |
| 12 bar | Start | | | 3.763 | | | | | | | | | | | | | | |
| | Run | | | 1.706 | | | | | | | | | | | | | | |
| | End | | | 3.141 | | | | | | | | | | | | | | |
| Spring | Start | 899 | 1.280 | 1.697 | 899 | 1.280 | 1.697 | 2.208 | 2.785 | 899 | 1.280 | 1.697 | 2.208 | 2.785 | 1.280 | 1.697 | 2.208 | 2.785 |
| | Run | 371 | 529 | 701 | 371 | 529 | 701 | 912 | 1.150 | 371 | 529 | 701 | 912 | 1.150 | 529 | 701 | 912 | 1.150 |
| | End | 570 | 811 | 1.075 | 570 | 811 | 1.075 | 1.399 | 1.765 | 570 | 811 | 1.075 | 1.399 | 1.765 | 811 | 1.075 | 1.399 | 1.765 |

OUTPUT TORQUE (Nm)

DOUBLE ACTING TORQUE

| Supply pressure | | AT-HDC 035 DA | | | | AT-HDC 045 DA | | | | AT-HDC 055 DA | | | | AT-HDC 065 DA | | | | |
|-----------------|-------|---------------|-----|-----|-----|---------------|-----|-----|-----|---------------|-------|-------|-------|---------------|-------|-------|-------|-------|
| | | 080 | 100 | 125 | 150 | 125 | 150 | 175 | 200 | 175 | 200 | 225 | 250 | 225 | 250 | 280 | 330 | |
| 2,5 bar | OPEN | Start | 69 | 107 | 168 | 241 | 215 | 310 | 422 | 551 | 516 | 674 | 853 | 1053 | 1.008 | 1.244 | 1.561 | 2.168 |
| | | Run | 34 | 54 | 84 | 121 | 108 | 155 | 211 | 276 | 258 | 337 | 426 | 526 | 504 | 622 | 780 | 1.084 |
| | | End | 69 | 107 | 168 | 241 | 215 | 310 | 422 | 551 | 516 | 674 | 853 | 1053 | 1.008 | 1.244 | 1.561 | 2.168 |
| | CLOSE | Start | 66 | 104 | 165 | 238 | 212 | 307 | 419 | 548 | 509 | 667 | 846 | 1046 | 1.000 | 1.236 | 1.553 | 2.160 |
| | | Run | 33 | 52 | 82 | 119 | 106 | 153 | 209 | 274 | 255 | 334 | 423 | 523 | 500 | 618 | 776 | 1.080 |
| | | End | 66 | 104 | 165 | 238 | 212 | 307 | 419 | 548 | 509 | 667 | 846 | 1046 | 1.000 | 1.236 | 1.553 | 2.160 |
| 3 bar | OPEN | Start | 82 | 129 | 201 | 289 | 258 | 372 | 507 | 662 | 619 | 809 | 1023 | 1264 | 1.210 | 1.493 | 1.873 | 2.602 |
| | | Run | 41 | 64 | 101 | 145 | 129 | 186 | 253 | 331 | 310 | 404 | 512 | 632 | 605 | 747 | 937 | 1.301 |
| | | End | 82 | 129 | 201 | 289 | 258 | 372 | 507 | 662 | 619 | 809 | 1023 | 1264 | 1.210 | 1.493 | 1.873 | 2.602 |
| | CLOSE | Start | 79 | 125 | 198 | 286 | 254 | 368 | 502 | 657 | 611 | 801 | 1015 | 1255 | 1.200 | 1.484 | 1.864 | 2.592 |
| | | Run | 40 | 63 | 99 | 143 | 127 | 184 | 251 | 329 | 306 | 400 | 508 | 628 | 600 | 742 | 932 | 1.296 |
| | | End | 79 | 125 | 198 | 286 | 254 | 368 | 502 | 657 | 611 | 801 | 1015 | 1255 | 1.200 | 1.484 | 1.864 | 2.592 |
| 3,5 bar | OPEN | Start | 96 | 150 | 235 | 338 | 302 | 434 | 591 | 772 | 722 | 943 | 1194 | 1474 | 1.411 | 1.742 | 2.185 | 3.035 |
| | | Run | 48 | 75 | 117 | 169 | 151 | 217 | 295 | 386 | 361 | 472 | 597 | 737 | 706 | 871 | 1.093 | 1.518 |
| | | End | 96 | 150 | 235 | 338 | 302 | 434 | 591 | 772 | 722 | 943 | 1194 | 1474 | 1.411 | 1.742 | 2.185 | 3.035 |
| | CLOSE | Start | 92 | 146 | 231 | 334 | 297 | 429 | 586 | 767 | 713 | 934 | 1185 | 1465 | 1.400 | 1.731 | 2.174 | 3.024 |
| | | Run | 46 | 73 | 115 | 167 | 148 | 215 | 293 | 383 | 356 | 467 | 592 | 732 | 700 | 865 | 1.087 | 1.512 |
| | | End | 92 | 146 | 231 | 334 | 297 | 429 | 586 | 767 | 713 | 934 | 1185 | 1465 | 1.400 | 1.731 | 2.174 | 3.024 |
| 4 bar | OPEN | Start | 110 | 172 | 268 | 386 | 345 | 496 | 675 | 882 | 825 | 1.078 | 1.365 | 1.685 | 1.613 | 1.991 | 2.497 | 3.469 |
| | | Run | 55 | 86 | 134 | 193 | 172 | 248 | 338 | 441 | 413 | 539 | 682 | 842 | 806 | 995 | 1.249 | 1.735 |
| | | End | 110 | 172 | 268 | 386 | 345 | 496 | 675 | 882 | 825 | 1.078 | 1.365 | 1.685 | 1.613 | 1.991 | 2.497 | 3.469 |
| | CLOSE | Start | 105 | 167 | 264 | 382 | 339 | 491 | 670 | 877 | 815 | 1.067 | 1.354 | 1.674 | 1.600 | 1.978 | 2.485 | 3.456 |
| | | Run | 53 | 84 | 132 | 191 | 169 | 245 | 335 | 438 | 407 | 534 | 677 | 837 | 800 | 989 | 1.242 | 1.728 |
| | | End | 105 | 167 | 264 | 382 | 339 | 491 | 670 | 877 | 815 | 1.067 | 1.354 | 1.674 | 1.600 | 1.978 | 2.485 | 3.456 |
| 4,5 bar | OPEN | Start | 124 | 193 | 302 | 434 | 388 | 558 | 760 | 992 | 929 | 1.213 | 1.535 | 1.895 | 1.814 | 2.240 | 2.810 | 3.903 |
| | | Run | 62 | 96 | 151 | 217 | 194 | 279 | 380 | 496 | 464 | 606 | 768 | 948 | 907 | 1.120 | 1.405 | 1.951 |
| | | End | 124 | 193 | 302 | 434 | 388 | 558 | 760 | 992 | 929 | 1.213 | 1.535 | 1.895 | 1.814 | 2.240 | 2.810 | 3.903 |
| | CLOSE | Start | 119 | 188 | 297 | 429 | 381 | 552 | 753 | 986 | 917 | 1.201 | 1.523 | 1.883 | 1.800 | 2.226 | 2.795 | 3.888 |
| | | Run | 59 | 94 | 148 | 215 | 191 | 276 | 377 | 493 | 458 | 600 | 762 | 942 | 900 | 1.113 | 1.398 | 1.944 |
| | | End | 119 | 188 | 297 | 429 | 381 | 552 | 753 | 986 | 917 | 1.201 | 1.523 | 1.883 | 1.800 | 2.226 | 2.795 | 3.888 |
| 5 bar | OPEN | Start | 137 | 214 | 335 | 482 | 431 | 620 | 844 | | 1.032 | 1.348 | 1.706 | | 2.016 | 2.489 | 3.122 | |
| | | Run | 69 | 107 | 168 | 241 | 215 | 310 | 422 | | 516 | 674 | 853 | | 1.008 | 1.244 | 1.561 | |
| | | End | 137 | 214 | 335 | 482 | 431 | 620 | 844 | | 1.032 | 1.348 | 1.706 | | 2.016 | 2.489 | 3.122 | |
| | CLOSE | Start | 132 | 209 | 330 | 477 | 424 | 613 | 837 | | 1.018 | 1.334 | 1.692 | | 2.000 | 2.473 | 3.106 | |
| | | Run | 66 | 104 | 165 | 238 | 212 | 307 | 419 | | 509 | 667 | 846 | | 1.000 | 1.236 | 1.553 | |
| | | End | 132 | 209 | 330 | 477 | 424 | 613 | 837 | | 1.018 | 1.334 | 1.692 | | 2.000 | 2.473 | 3.106 | |
| 5,5 bar | OPEN | Start | 151 | 236 | 369 | | 474 | 682 | 929 | | 1.135 | 1.483 | 1.876 | | 2.217 | 2.738 | 3.434 | |
| | | Run | 75 | 118 | 184 | | 237 | 341 | 464 | | 568 | 741 | 938 | | 1.109 | 1.369 | 1.717 | |
| | | End | 151 | 236 | 369 | | 474 | 682 | 929 | | 1.135 | 1.483 | 1.876 | | 2.217 | 2.738 | 3.434 | |
| | CLOSE | Start | 145 | 230 | 362 | | 466 | 675 | 921 | | 1.120 | 1.468 | 1.861 | | 2.200 | 2.720 | 3.417 | |
| | | Run | 72 | 115 | 181 | | 233 | 337 | 460 | | 560 | 734 | 931 | | 1.100 | 1.360 | 1.708 | |
| | | End | 145 | 230 | 362 | | 466 | 675 | 921 | | 1.120 | 1.468 | 1.861 | | 2.200 | 2.720 | 3.417 | |
| 6 bar | OPEN | Start | 165 | 257 | 402 | | 517 | 744 | | | 1.238 | 1.617 | | | 2.419 | 2.986 | 3.746 | |
| | | Run | 82 | 129 | 201 | | 258 | 372 | | | 619 | 809 | | | 1.210 | 1.493 | 1.873 | |
| | | End | 165 | 257 | 402 | | 517 | 744 | | | 1.238 | 1.617 | | | 2.419 | 2.986 | 3.746 | |
| | CLOSE | Start | 158 | 251 | 395 | | 508 | 736 | | | 1.222 | 1.601 | | | 2.400 | 2.967 | 3.727 | |
| | | Run | 79 | 125 | 198 | | 254 | 368 | | | 611 | 801 | | | 1.200 | 1.484 | 1.864 | |
| | | End | 158 | 251 | 395 | | 508 | 736 | | | 1.222 | 1.601 | | | 2.400 | 2.967 | 3.727 | |
| 6,5 bar | OPEN | Start | 178 | 279 | 436 | | 560 | 806 | | | 1.341 | 1.752 | | | 2.621 | 3.235 | | |
| | | Run | 89 | 139 | 218 | | 280 | 403 | | | 671 | 876 | | | 1.310 | 1.618 | | |
| | | End | 178 | 279 | 436 | | 560 | 806 | | | 1.341 | 1.752 | | | 2.621 | 3.235 | | |
| | CLOSE | Start | 171 | 272 | 428 | | 551 | 797 | | | 1.324 | 1.735 | | | 2.600 | 3.215 | | |
| | | Run | 86 | 136 | 214 | | 275 | 399 | | | 662 | 867 | | | 1.300 | 1.607 | | |
| | | End | 171 | 272 | 428 | | 551 | 797 | | | 1.324 | 1.735 | | | 2.600 | 3.215 | | |
| 7 bar | OPEN | Start | 192 | 300 | 469 | | 603 | 868 | | | 1.445 | 1.887 | | | 2.822 | 3.484 | | |
| | | Run | 96 | 150 | 235 | | 302 | 434 | | | 722 | 943 | | | 1.411 | 1.742 | | |
| | | End | 192 | 300 | 469 | | 603 | 868 | | | 1.445 | 1.887 | | | 2.822 | 3.484 | | |
| | CLOSE | Start | 184 | 292 | 461 | | 593 | 858 | | | 1.426 | 1.868 | | | 2.800 | 3.462 | | |
| | | Run | 92 | 146 | 231 | | 297 | 429 | | | 713 | 934 | | | 1.400 | 1.731 | | |
| | | End | 184 | 292 | 461 | | 593 | 858 | | | 1.426 | 1.868 | | | 2.800 | 3.462 | | |

OUTPUT TORQUE (Nm)

DOUBLE ACTING TORQUE

| Supply pressure | | AT-HDC 035 DA | | | | AT-HDC 045 DA | | | | AT-HDC 055 DA | | | | AT-HDC 065 DA | | | |
|-----------------|-------|---------------|-----|-----|-----|---------------|-----|-----|-----|---------------|-------|-----|-------|---------------|-------|-----|-----|
| | | 080 | 100 | 125 | 150 | 125 | 150 | 175 | 200 | 175 | 200 | 225 | 250 | 225 | 250 | 280 | 330 |
| 7,5 bar | OPEN | Start | 206 | 322 | | | 646 | 930 | | | 1.548 | | | 3.024 | 3.733 | | |
| | | Run | 103 | 161 | | | 323 | 465 | | | 774 | | | 1.512 | 1.867 | | |
| | | End | 206 | 322 | | | 646 | 930 | | | 1.548 | | | 3.024 | 3.733 | | |
| | CLOSE | Start | 198 | 313 | | | 636 | 920 | | | 1.528 | | | 3.000 | 3.709 | | |
| | | Run | 99 | 157 | | | 318 | 460 | | | 764 | | | 1.500 | 1.855 | | |
| | | End | 198 | 313 | | | 636 | 920 | | | 1.528 | | | 3.000 | 3.709 | | |
| 8 bar | OPEN | Start | 220 | 343 | | | 689 | 992 | | | 1.651 | | | 3.225 | 3.982 | | |
| | | Run | 110 | 172 | | | 345 | 496 | | | 825 | | | 1.613 | 1.991 | | |
| | | End | 220 | 343 | | | 689 | 992 | | | 1.651 | | | 3.225 | 3.982 | | |
| | CLOSE | Start | 211 | 334 | | | 678 | 981 | | | 1.629 | | | 3.200 | 3.956 | | |
| | | Run | 105 | 167 | | | 339 | 491 | | | 815 | | | 1.600 | 1.978 | | |
| | | End | 211 | 334 | | | 678 | 981 | | | 1.629 | | | 3.200 | 3.956 | | |
| 8,5 bar | OPEN | Start | 233 | 365 | | | 732 | | | 1.754 | | | 3.427 | | | | |
| | | Run | 117 | 182 | | | 366 | | | | 877 | | | 1.713 | | | |
| | | End | 233 | 365 | | | 732 | | | | 1.754 | | | 3.427 | | | |
| | CLOSE | Start | 224 | 355 | | | 720 | | | | 1.731 | | | 3.400 | | | |
| | | Run | 112 | 178 | | | 360 | | | | 866 | | | 1.700 | | | |
| | | End | 224 | 355 | | | 720 | | | | 1.731 | | | 3.400 | | | |
| 9 bar | OPEN | Start | 247 | 386 | | | 775 | | | 1.857 | | | 3.629 | | | | |
| | | Run | 124 | 193 | | | 388 | | | | 929 | | | 1.814 | | | |
| | | End | 247 | 386 | | | 775 | | | | 1.857 | | | 3.629 | | | |
| | CLOSE | Start | 237 | 376 | | | 763 | | | | 1.833 | | | 3.600 | | | |
| | | Run | 119 | 188 | | | 381 | | | | 917 | | | 1.800 | | | |
| | | End | 237 | 376 | | | 763 | | | | 1.833 | | | 3.600 | | | |
| 9,5 bar | OPEN | Start | 261 | 407 | | | 818 | | | 1.961 | | | 3.830 | | | | |
| | | Run | 130 | 204 | | | 409 | | | | 980 | | | 1.915 | | | |
| | | End | 261 | 407 | | | 818 | | | | 1.961 | | | 3.830 | | | |
| | CLOSE | Start | 250 | 397 | | | 805 | | | | 1.935 | | | 3.800 | | | |
| | | Run | 125 | 198 | | | 403 | | | | 967 | | | 1.900 | | | |
| | | End | 250 | 397 | | | 805 | | | | 1.935 | | | 3.800 | | | |
| 10 bar | OPEN | Start | 274 | 429 | | | 861 | | | | | | | | | | |
| | | Run | 137 | 214 | | | 431 | | | | | | | | | | |
| | | End | 274 | 429 | | | 861 | | | | | | | | | | |
| | CLOSE | Start | 263 | 418 | | | 847 | | | | | | | | | | |
| | | Run | 132 | 209 | | | 424 | | | | | | | | | | |
| | | End | 263 | 418 | | | 847 | | | | | | | | | | |
| 10,5 bar | OPEN | Start | 288 | 450 | | | 905 | | | | | | | | | | |
| | | Run | 144 | 225 | | | 452 | | | | | | | | | | |
| | | End | 288 | 450 | | | 905 | | | | | | | | | | |
| | CLOSE | Start | 277 | 439 | | | 890 | | | | | | | | | | |
| | | Run | 138 | 219 | | | 445 | | | | | | | | | | |
| | | End | 277 | 439 | | | 890 | | | | | | | | | | |
| 11 bar | OPEN | Start | 302 | 472 | | | 948 | | | | | | | | | | |
| | | Run | 151 | 236 | | | 474 | | | | | | | | | | |
| | | End | 302 | 472 | | | 948 | | | | | | | | | | |
| | CLOSE | Start | 290 | 460 | | | 932 | | | | | | | | | | |
| | | Run | 145 | 230 | | | 466 | | | | | | | | | | |
| | | End | 290 | 460 | | | 932 | | | | | | | | | | |
| 11,5 bar | OPEN | Start | 316 | 493 | | | 991 | | | | | | | | | | |
| | | Run | 158 | 247 | | | 495 | | | | | | | | | | |
| | | End | 316 | 493 | | | 991 | | | | | | | | | | |
| | CLOSE | Start | 303 | 481 | | | 974 | | | | | | | | | | |
| | | Run | 151 | 240 | | | 487 | | | | | | | | | | |
| | | End | 303 | 481 | | | 974 | | | | | | | | | | |
| 12 bar | OPEN | Start | 329 | 515 | | | | | | | | | | | | | |
| | | Run | 165 | 257 | | | | | | | | | | | | | |
| | | End | 329 | 515 | | | | | | | | | | | | | |
| | CLOSE | Start | 316 | 501 | | | | | | | | | | | | | |
| | | Run | 158 | 251 | | | | | | | | | | | | | |
| | | End | 316 | 501 | | | | | | | | | | | | | |

OUTPUT TORQUE (Lb-In)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 035 SR - P080 | | AT-HDC 035 SR - P100 | | | | AT-HDC 035 SR - P125 | | | | | AT-HDC 035 SR - P150 | | | | |
|-----------------|----------------------|-------|----------------------|-------|-------|-------|----------------------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|
| | SC02 | SC04 | SC02 | SC04 | SC06 | SC08 | SC02 | SC04 | SC06 | SC08 | SC10 | SC04 | SC06 | SC08 | SC10 | |
| 2,5 bar | Start | | | | | | 965 | 717 | | | | 1.372 | 929 | | | |
| | Run | | | | | | 381 | 186 | | | | 531 | 257 | | | |
| | End | | | | | | 611 | 195 | | | | 841 | 274 | | | |
| 3 bar | Start | | | 620 | | | 1.266 | 1.018 | | | | 1.797 | 1.363 | | | |
| | Run | | | 204 | | | 531 | 354 | | | | 752 | 487 | | | |
| | End | | | 266 | | | 903 | 487 | | | | 1.275 | 699 | | | |
| 3,5 bar | Start | | | 814 | | | 1.558 | 1.310 | | | | 2.230 | 1.788 | 1.531 | | |
| | Run | | | 301 | | | 682 | 504 | | | | 965 | 699 | 469 | | |
| | End | | | 451 | | | 1.204 | 788 | | | | 1.699 | 1.124 | 575 | | |
| 4 bar | Start | | | 1.000 | 752 | | 1.859 | 1.611 | 1.168 | | | 2.655 | 2.213 | 1.956 | | |
| | Run | | | 398 | 212 | | 823 | 655 | 389 | | | 1.177 | 920 | 699 | | |
| | End | | | 646 | 230 | | 1.496 | 1.080 | 513 | | | 2.124 | 1.549 | 1.009 | | |
| 4,5 bar | Start | 575 | | 1.195 | 947 | | 2.151 | 1.903 | 1.469 | | | 3.080 | 2.638 | 2.381 | 1.912 | |
| | Run | 177 | | 496 | 310 | | 974 | 805 | 540 | | | 1.390 | 1.133 | 912 | 558 | |
| | End | 221 | | 832 | 416 | | 1.797 | 1.381 | 805 | | | 2.549 | 1.983 | 1.434 | 646 | |
| 5 bar | Start | 699 | | 1.381 | 1.133 | | 2.452 | 2.204 | 1.761 | 1.505 | | 3.505 | 3.071 | 2.806 | 2.337 | |
| | Run | 239 | | 584 | 407 | | 1.124 | 947 | 690 | 460 | | 1.602 | 1.345 | 1.133 | 788 | |
| | End | 336 | | 1.027 | 602 | | 2.089 | 1.673 | 1.106 | 558 | | 2.983 | 2.407 | 1.859 | 1.071 | |
| 5,5 bar | Start | 823 | | 1.567 | 1.328 | | 2.744 | 2.496 | 2.062 | 1.806 | | 3.939 | 3.496 | 3.239 | 2.770 | |
| | Run | 301 | | 682 | 504 | | 1.275 | 1.097 | 841 | 620 | | 1.814 | 1.558 | 1.345 | 1.009 | |
| | End | 460 | | 1.213 | 797 | | 2.390 | 1.974 | 1.398 | 850 | | 3.408 | 2.832 | 2.283 | 1.496 | |
| 6 bar | Start | 938 | | 1.761 | 1.513 | 1.080 | 3.045 | 2.797 | 2.354 | 2.098 | | 4.363 | 3.921 | 3.664 | 3.195 | |
| | Run | 363 | | 779 | 602 | 336 | 1.416 | 1.248 | 991 | 770 | | 2.036 | 1.779 | 1.558 | 1.230 | |
| | End | 584 | | 1.398 | 982 | 416 | 2.682 | 2.266 | 1.699 | 1.151 | | 3.832 | 3.257 | 2.717 | 1.929 | |
| 6,5 bar | Start | 1.062 | 814 | 1.947 | 1.708 | 1.266 | 3.337 | 3.089 | 2.655 | 2.399 | 1.921 | | 4.346 | 4.089 | 3.620 | |
| | Run | 425 | 248 | 876 | 699 | 434 | 1.567 | 1.398 | 1.142 | 920 | 566 | | 1.991 | 1.779 | 1.443 | |
| | End | 699 | 283 | 1.593 | 1.177 | 602 | 2.983 | 2.567 | 1.991 | 1.443 | 655 | | 3.691 | 3.142 | 2.354 | |
| 7 bar | Start | 1.186 | 938 | 2.142 | 1.894 | 1.452 | 3.638 | 3.390 | 2.947 | 2.691 | 2.222 | | | | 4.045 | |
| | Run | 487 | 310 | 965 | 797 | 531 | 1.717 | 1.549 | 1.283 | 1.071 | 726 | | | | 1.655 | |
| | End | 823 | 407 | 1.779 | 1.363 | 797 | 3.275 | 2.859 | 2.292 | 1.744 | 956 | | | | 2.779 | |
| 7,5 bar | Start | 1.301 | 1.062 | 2.328 | 2.089 | 1.646 | 3.930 | 3.682 | 3.248 | 2.992 | 2.514 | | | | | |
| | Run | 549 | 372 | 1.062 | 894 | 628 | 1.868 | 1.690 | 1.434 | 1.221 | 885 | | | | | |
| | End | 947 | 531 | 1.974 | 1.558 | 982 | 3.576 | 3.160 | 2.584 | 2.036 | 1.248 | | | | | |
| 8 bar | Start | 1.425 | 1.177 | 2.522 | 2.275 | 1.832 | 4.231 | 3.983 | 3.540 | 3.284 | 2.815 | | | | | |
| | Run | 611 | 434 | 1.159 | 982 | 726 | 2.018 | 1.841 | 1.584 | 1.372 | 1.036 | | | | | |
| | End | 1.071 | 655 | 2.160 | 1.744 | 1.177 | 3.868 | 3.452 | 2.885 | 2.337 | 1.549 | | | | | |
| 8,5 bar | Start | 1.549 | 1.301 | 2.708 | 2.461 | 2.027 | 4.525 | 4.275 | 3.841 | 3.585 | 3.107 | | | | | |
| | Run | 673 | 496 | 1.257 | 1.080 | 823 | 1.991 | 1.735 | 1.522 | 1.286 | | | | | | |
| | End | 1.186 | 770 | 2.354 | 1.938 | 1.363 | 3.753 | 3.177 | 2.629 | 1.841 | | | | | | |
| 9 bar | Start | 1.673 | 1.425 | 2.903 | 2.655 | 2.213 | | | 4.133 | 3.877 | 3.408 | | | | | |
| | Run | 735 | 558 | 1.345 | 1.177 | 920 | | | 1.885 | 1.664 | 1.336 | | | | | |
| | End | 1.310 | 894 | 2.540 | 2.124 | 1.549 | | | 3.478 | 2.930 | 2.142 | | | | | |
| 9,5 bar | Start | 1.788 | 1.549 | 3.089 | 2.841 | 2.407 | 4.819 | 4.569 | 4.133 | 3.877 | 3.408 | | | | | |
| | Run | 797 | 620 | 1.443 | 1.275 | 1.009 | | | | 1.814 | 1.487 | | | | | |
| | End | 1.434 | 1.018 | 2.726 | 2.310 | 1.744 | | | | 3.222 | 2.434 | | | | | |
| 10 bar | Start | 1.912 | 1.664 | 3.275 | 3.036 | 2.593 | 5.114 | 4.864 | 4.428 | 4.178 | 3.700 | | | | | |
| | Run | 859 | 682 | 1.540 | 1.363 | 1.106 | | | | | 1.637 | | | | | |
| | End | 1.558 | 1.142 | 2.921 | 2.505 | 1.929 | | | | | 2.735 | | | | | |
| 10,5 bar | Start | 2.036 | 1.788 | 3.469 | 3.222 | 2.788 | 5.403 | 5.153 | 4.717 | 4.467 | 4.001 | | | | | |
| | Run | 912 | 743 | 1.637 | 1.460 | 1.204 | | | | | 1.788 | | | | | |
| | End | 1.673 | 1.257 | 3.107 | 2.691 | 2.124 | | | | | 3.027 | | | | | |
| 11 bar | Start | 2.160 | 1.912 | 3.655 | 3.416 | 2.974 | 5.692 | 5.442 | 5.006 | 4.756 | 4.290 | | | | | |
| | Run | 974 | 805 | 1.726 | 1.558 | 1.301 | | | | | 1.080 | | | | | |
| | End | 1.797 | 1.381 | 3.301 | 2.885 | 2.310 | | | | | 1.761 | | | | | |
| 11,5 bar | Start | 2.275 | 2.036 | 3.850 | 3.602 | 3.160 | 5.980 | 5.730 | 5.294 | 5.044 | 4.578 | | | | | |
| | Run | 1.036 | 867 | 1.823 | 1.655 | 1.398 | | | | | 1.177 | | | | | |
| | End | 1.921 | 1.505 | 3.487 | 3.071 | 2.505 | | | | | 1.956 | | | | | |
| 12 bar | Start | 2.399 | 2.151 | 4.036 | 3.788 | 3.354 | 6.268 | 6.018 | 5.582 | 5.332 | 4.866 | | | | | |
| | Run | 1.097 | 929 | 1.921 | 1.744 | 1.487 | | | | | 1.275 | | | | | |
| | End | 2.036 | 1.620 | 3.682 | 3.266 | 2.691 | | | | | 2.142 | | | | | |
| Spring | Start | 876 | 1.292 | 876 | 1.292 | 1.868 | 2.407 | 876 | 1.292 | 1.868 | 2.407 | 3.195 | 1.292 | 1.868 | 2.407 | 3.195 |
| | Run | 354 | 522 | 354 | 522 | 779 | 974 | 354 | 522 | 779 | 974 | 1.292 | 522 | 779 | 974 | 1.292 |
| | End | 513 | 761 | 513 | 761 | 1.204 | 1.460 | 513 | 761 | 1.204 | 1.460 | 1.929 | 761 | 1.204 | 1.460 | 1.929 |

OUTPUT TORQUE (Lb-In)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 045 SR - P125 | | | AT-HDC 045 SR - P150 | | | | | AT-HDC 045 SR - P175 | | | | | AT-HDC 045 SR - P200 | | | | | |
|-----------------|----------------------|-------|-------|----------------------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|----------------------|-------|-------|-------|-------|-------|
| | SC02 | SC04 | SC06 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | |
| 2,5 bar | Start | | | | | | | | 1.744 | | | | | 2.885 | 2.434 | | | | |
| | Run | | | | | | | | 496 | | | | | 1.089 | 752 | | | | |
| | End | | | | | | | | 540 | | | | | 1.682 | 920 | | | | |
| 3 bar | Start | | | | | | | | 2.496 | | | | | 3.868 | 3.408 | 2.850 | | | |
| | Run | | | | | | | | 885 | | | | | 1.584 | 1.257 | 867 | | | |
| | End | | | | | | | | 1.292 | | | | | 2.664 | 1.894 | 1.044 | | | |
| 3,5 bar | Start | | | | 1.850 | | | | 3.239 | 2.779 | | | | 4.841 | 4.381 | 3.824 | 3.257 | | |
| | Run | | | | 549 | | | | 1.266 | 938 | | | | 2.080 | 1.752 | 1.381 | 982 | | |
| | End | | | | 646 | | | | 2.036 | 1.275 | | | | 3.638 | 2.876 | 2.018 | 1.177 | | |
| 4 bar | Start | | | | 2.399 | | | | 3.992 | 3.531 | 2.974 | | | 5.815 | 5.364 | 4.806 | 4.231 | 3.744 | |
| | Run | | | | 841 | | | | 1.646 | 1.319 | 929 | | | 2.567 | 2.248 | 1.876 | 1.496 | 1.044 | |
| | End | | | | 1.195 | | | | 2.779 | 2.018 | 1.159 | | | 4.611 | 3.850 | 2.992 | 2.151 | 1.115 | |
| 4,5 bar | Start | | | | 2.947 | 2.496 | | | 4.735 | 4.275 | 3.717 | 3.151 | | 6.797 | 6.337 | 5.780 | 5.213 | 4.726 | |
| | Run | | | | 1.124 | 788 | | | 2.027 | 1.699 | 1.319 | 929 | | 3.054 | 2.735 | 2.372 | 2.000 | 1.567 | |
| | End | | | | 1.744 | 982 | | | 3.531 | 2.770 | 1.912 | 1.071 | | 5.585 | 4.824 | 3.974 | 3.124 | 2.089 | |
| 5 bar | Start | 1.823 | | | 3.496 | 3.045 | 2.487 | | 5.479 | 5.027 | 4.470 | 3.894 | | 7.771 | 7.311 | 6.753 | 6.187 | 5.700 | |
| | Run | 540 | | | 1.398 | 1.071 | 664 | | 2.399 | 2.080 | 1.708 | 1.328 | | 3.549 | 3.231 | 2.859 | 2.487 | 2.071 | |
| | End | 620 | | | 2.292 | 1.531 | 673 | | 4.275 | 3.514 | 2.655 | 1.814 | | 6.567 | 5.797 | 4.948 | 4.107 | 3.071 | |
| 5,5 bar | Start | 2.204 | | | 4.045 | 3.593 | 3.036 | | 6.231 | 5.771 | 5.213 | 4.647 | 4.160 | 8.745 | 8.284 | 7.727 | 7.160 | 6.673 | |
| | Run | 735 | | | 1.682 | 1.354 | 965 | | 2.770 | 2.452 | 2.080 | 1.708 | 1.266 | 4.036 | 3.717 | 3.354 | 2.983 | 2.567 | |
| | End | 1.000 | | | 2.841 | 2.080 | 1.221 | | 5.027 | 4.257 | 3.408 | 2.567 | 1.531 | 7.541 | 6.780 | 5.921 | 5.080 | 4.045 | |
| 6 bar | Start | 2.584 | 2.124 | | 4.594 | 4.142 | 3.585 | 3.009 | 6.974 | 6.523 | 5.957 | 5.390 | 4.903 | | | 8.709 | 8.134 | 7.656 | |
| | Run | 938 | 584 | | 1.956 | 1.629 | 1.248 | 850 | 3.151 | 2.832 | 2.461 | 2.089 | 1.664 | | | 3.841 | 3.478 | 3.062 | |
| | End | 1.381 | 620 | | 3.390 | 2.629 | 1.770 | 929 | 5.771 | 5.010 | 4.151 | 3.310 | 2.275 | | | 6.895 | 6.054 | 5.018 | |
| 6,5 bar | Start | 2.965 | 2.505 | | 5.142 | 4.691 | 4.133 | 3.558 | 7.727 | 7.266 | 6.709 | 6.142 | 5.656 | | | | | 8.629 | |
| | Run | 1.133 | 797 | | 2.230 | 1.912 | 1.531 | 1.151 | 3.523 | 3.204 | 2.841 | 2.469 | 2.053 | | | | | 3.558 | |
| | End | 1.761 | 1.000 | | 3.939 | 3.177 | 2.319 | 1.478 | 6.523 | 5.753 | 4.903 | 4.054 | 3.027 | | | | | 6.001 | |
| 7 bar | Start | 3.346 | 2.894 | | 5.691 | 5.240 | 4.682 | 4.107 | 8.470 | 8.010 | 7.452 | 6.886 | 6.399 | | | | | | |
| | Run | 1.328 | 991 | | 2.505 | 2.186 | 1.814 | 1.434 | 3.894 | 3.576 | 3.213 | 2.841 | 2.434 | | | | | | |
| | End | 2.142 | 1.381 | | 4.487 | 3.726 | 2.868 | 2.027 | 7.266 | 6.505 | 5.647 | 4.806 | 3.770 | | | | | | |
| 7,5 bar | Start | 3.726 | 3.275 | 2.708 | 6.249 | 5.788 | 5.231 | 4.664 | | 8.762 | 8.205 | 7.629 | 7.151 | | | | | | |
| | Run | 1.513 | 1.186 | 788 | 2.779 | 2.461 | 2.089 | 1.717 | 1.275 | 3.956 | 3.585 | 3.222 | 2.815 | | | | | | |
| | End | 2.522 | 1.761 | 903 | 5.036 | 4.275 | 3.416 | 2.576 | 1.540 | 7.249 | 6.390 | 5.549 | 4.514 | | | | | | |
| 8 bar | Start | 4.107 | 3.655 | 3.098 | 6.797 | 6.337 | 5.780 | 5.213 | 4.726 | | | 8.382 | 7.895 | | | | | | |
| | Run | 1.708 | 1.381 | 1.000 | 3.054 | 2.735 | 2.372 | 2.000 | 1.567 | | | 3.593 | 3.186 | | | | | | |
| | End | 2.903 | 2.142 | 1.283 | 5.585 | 4.824 | 3.974 | 3.124 | 2.089 | | | 6.302 | 5.266 | | | | | | |
| 8,5 bar | Start | 4.487 | 4.036 | 3.478 | 7.346 | 6.886 | 6.328 | 5.762 | 5.275 | | | | 8.647 | | | | | | |
| | Run | 1.903 | 1.575 | 1.195 | 3.328 | 3.018 | 2.646 | 2.275 | 1.850 | | | | 3.567 | | | | | | |
| | End | 3.284 | 2.522 | 1.664 | 6.134 | 5.372 | 4.523 | 3.673 | 2.646 | | | | 6.010 | | | | | | |
| 9 bar | Start | 4.868 | 4.417 | 3.859 | 7.895 | 7.435 | 6.877 | 6.311 | 5.824 | | | | | | | | | | |
| | Run | 2.089 | 1.770 | 1.390 | 3.611 | 3.292 | 2.921 | 2.549 | 2.133 | | | | | | | | | | |
| | End | 3.664 | 2.903 | 2.045 | 6.682 | 5.921 | 5.071 | 4.222 | 3.195 | | | | | | | | | | |
| 9,5 bar | Start | 5.257 | 4.797 | 4.240 | 8.444 | 7.983 | 7.426 | 6.859 | 6.373 | | | | | | | | | | |
| | Run | 2.283 | 1.965 | 1.584 | 3.885 | 3.567 | 3.195 | 2.832 | 2.416 | | | | | | | | | | |
| | End | 4.045 | 3.284 | 2.425 | 7.240 | 6.470 | 5.620 | 4.771 | 3.744 | | | | | | | | | | |
| 10 bar | Start | 5.638 | 5.178 | 4.620 | | 8.532 | 7.975 | 7.408 | 6.921 | | | | | | | | | | |
| | Run | 2.478 | 2.151 | 1.779 | | 3.841 | 3.469 | 3.107 | 2.691 | | | | | | | | | | |
| | End | 4.425 | 3.664 | 2.815 | | 7.019 | 6.169 | 5.319 | 4.293 | | | | | | | | | | |
| 10,5 bar | Start | 6.019 | 5.558 | 5.001 | | | 8.523 | 7.957 | 7.470 | | | | | | | | | | |
| | Run | 2.664 | 2.345 | 1.974 | | | 3.753 | 3.381 | 2.974 | | | | | | | | | | |
| | End | 4.815 | 4.045 | 3.195 | | | 6.718 | 5.868 | 4.841 | | | | | | | | | | |
| 11 bar | Start | 6.399 | 5.939 | 5.381 | | | | 8.506 | 8.019 | | | | | | | | | | |
| | Run | 2.859 | 2.540 | 2.168 | | | | 3.655 | 3.248 | | | | | | | | | | |
| | End | 5.195 | 4.425 | 3.576 | | | | 6.417 | 5.390 | | | | | | | | | | |
| 11,5 bar | Start | 6.780 | 6.319 | 5.762 | | | | | 8.568 | | | | | | | | | | |
| | Run | 3.045 | 2.726 | 2.363 | | | | | 3.523 | | | | | | | | | | |
| | End | 5.576 | 4.806 | 3.956 | | | | | 5.939 | | | | | | | | | | |
| 12 bar | Start | 7.160 | 6.700 | 6.142 | | | | | | | | | | | | | | | |
| | Run | 3.239 | 2.921 | 2.549 | | | | | | | | | | | | | | | |
| | End | 5.957 | 5.187 | 4.337 | | | | | | | | | | | | | | | |
| Spring | Start | 3.195 | 3.956 | 4.815 | 3.195 | 3.956 | 4.815 | 5.656 | 6.691 | 3.195 | 3.956 | 4.815 | 5.656 | 6.691 | 3.195 | 3.956 | 4.815 | 5.656 | 6.691 |
| | Run | 1.310 | 1.620 | 1.974 | 1.310 | 1.620 | 1.974 | 2.337 | 2.717 | 1.310 | 1.620 | 1.974 | 2.337 | 2.717 | 1.310 | 1.620 | 1.974 | 2.337 | 2.717 |
| | End | 1.991 | 2.452 | 3.009 | 1.991 | 2.452 | 3.009 | 3.576 | 4.062 | 1.991 | 2.452 | 3.009 | 3.576 | 4.062 | 1.991 | 2.452 | 3.009 | 3.576 | 4.062 |

OUTPUT TORQUE (Lb-In)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 055 SR - P175 | | | AT-HDC 055 SR - P200 | | | | | AT-HDC 055 SR - P225 | | | | | AT-HDC 055 SR - P250 | | | | |
|-----------------|----------------------|--------|--------|----------------------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|
| | SC02 | SC04 | SC06 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | SC04 | SC06 | SC08 | SC10 | |
| 2,5 bar | Start | | | 2.930 | | | | | 4.514 | 3.593 | | | | 5.364 | | | | |
| | Run | | | 850 | | | | | 1.682 | 991 | | | | 1.929 | | | | |
| | End | | | 974 | | | | | 2.558 | 1.053 | | | | 2.823 | | | | |
| 3 bar | Start | | | 4.116 | | | | | 6.019 | 5.098 | | | | 7.231 | 6.019 | | | |
| | Run | | | 1.478 | | | | | 2.452 | 1.797 | | | | 2.876 | 2.009 | | | |
| | End | | | 2.168 | | | | | 4.071 | 2.558 | | | | 4.682 | 2.708 | | | |
| 3,5 bar | Start | 3.354 | | 5.310 | 4.390 | | | | 7.532 | 6.612 | 5.408 | | | 9.090 | 7.886 | | | |
| | Run | 1.089 | | 2.089 | 1.425 | | | | 3.204 | 2.567 | 1.682 | | | 3.815 | 2.974 | | | |
| | End | 1.398 | | 3.363 | 1.850 | | | | 5.576 | 4.071 | 2.089 | | | 6.550 | 4.567 | | | |
| 4 bar | Start | 4.266 | | 6.505 | 5.585 | | | | 9.037 | 8.125 | 6.912 | | | 10.957 | 9.754 | 7.523 | | |
| | Run | 1.558 | | 2.691 | 2.045 | | | | 3.965 | 3.328 | 2.478 | | | 4.753 | 3.912 | 2.319 | | |
| | End | 2.319 | | 4.549 | 3.045 | | | | 7.089 | 5.576 | 3.602 | | | 8.408 | 6.434 | 2.841 | | |
| 4,5 bar | Start | 5.178 | 4.266 | 7.700 | 6.780 | 5.576 | | | 10.550 | 9.630 | 8.426 | | | 12.816 | 11.612 | 9.391 | 8.187 | |
| | Run | 2.027 | 1.354 | 3.292 | 2.646 | 1.779 | | | 4.726 | 4.089 | 3.248 | | | 5.691 | 4.859 | 3.301 | 2.390 | |
| | End | 3.231 | 1.717 | 5.744 | 4.240 | 2.257 | | | 8.594 | 7.089 | 5.107 | | | 10.276 | 8.293 | 4.709 | 2.726 | |
| 5 bar | Start | 6.098 | 5.178 | 8.895 | 7.975 | 6.771 | | | 12.055 | 11.143 | 9.939 | 7.709 | | 14.683 | 13.480 | 11.258 | 10.046 | |
| | Run | 2.487 | 1.832 | 3.894 | 3.257 | 2.399 | | | 5.479 | 4.850 | 4.009 | 2.425 | | 6.620 | 5.797 | 4.257 | 3.381 | |
| | End | 4.142 | 2.638 | 6.939 | 5.434 | 3.452 | | | 10.108 | 8.603 | 6.620 | 3.027 | | 12.143 | 10.161 | 6.567 | 4.594 | |
| 5,5 bar | Start | 7.010 | 6.089 | 4.886 | 10.081 | 9.169 | 7.957 | | | 13.568 | 12.648 | 11.444 | 9.222 | 8.019 | 16.542 | 15.338 | 13.117 | 11.913 |
| | Run | 2.947 | 2.301 | 1.398 | 4.487 | 3.859 | 3.009 | | | 6.240 | 5.603 | 4.771 | 3.213 | 2.292 | 7.559 | 6.727 | 5.204 | 4.346 |
| | End | 5.054 | 3.549 | 1.567 | 8.134 | 6.620 | 4.647 | | | 11.612 | 10.108 | 8.125 | 4.540 | 2.558 | 14.002 | 12.019 | 8.435 | 6.452 |
| 6 bar | Start | 7.921 | 7.001 | 5.797 | 11.276 | 10.355 | 9.152 | 6.930 | | | | | | | | | | |
| | Run | 3.408 | 2.761 | 1.894 | 5.089 | 4.452 | 3.611 | 2.000 | | | | | | | | | | |
| | End | 5.965 | 4.461 | 2.478 | 9.320 | 7.815 | 5.833 | 2.248 | | | | | | | | | | |
| 6,5 bar | Start | 8.833 | 7.913 | 6.709 | 12.471 | 11.550 | 10.347 | 8.125 | 6.921 | | | | | | | | | |
| | Run | 3.859 | 3.222 | 2.372 | 5.682 | 5.054 | 4.213 | 2.638 | 1.460 | | | | | | | | | |
| | End | 6.886 | 5.372 | 3.390 | 10.515 | 9.010 | 7.027 | 3.443 | 1.460 | | | | | | | | | |
| 7 bar | Start | 9.745 | 8.833 | 7.620 | 13.666 | 12.745 | 11.541 | 9.320 | 8.107 | | | | | | | | | |
| | Run | 4.319 | 3.682 | 2.841 | 6.284 | 5.656 | 4.815 | 3.266 | 2.345 | | | | | | | | | |
| | End | 7.798 | 6.284 | 4.310 | 11.710 | 10.205 | 8.222 | 4.629 | 2.655 | | | | | | | | | |
| 7,5 bar | Start | 10.665 | 9.745 | 8.541 | 14.852 | 13.940 | 12.727 | 10.506 | 9.302 | | | | | | | | | |
| | Run | 4.779 | 4.142 | 3.301 | 6.877 | 6.249 | 5.417 | 3.877 | 2.992 | | | | | | | | | |
| | End | 8.709 | 7.205 | 5.222 | 12.904 | 11.391 | 9.417 | 5.824 | 3.841 | | | | | | | | | |
| 8 bar | Start | 11.577 | 10.656 | 9.453 | 16.046 | 15.126 | 13.922 | 11.701 | 10.497 | | | | | | | | | |
| | Run | 5.240 | 4.602 | 3.762 | 7.479 | 6.850 | 6.019 | 4.487 | 3.611 | | | | | | | | | |
| | End | 9.621 | 8.116 | 6.134 | 14.099 | 12.586 | 10.603 | 7.019 | 5.036 | | | | | | | | | |
| 8,5 bar | Start | 12.488 | 11.568 | 10.364 | 17.241 | 16.321 | 15.117 | 12.896 | 11.692 | | | | | | | | | |
| | Run | 5.691 | 5.063 | 4.231 | 8.072 | 7.443 | 6.620 | 5.089 | 4.231 | | | | | | | | | |
| | End | 10.532 | 9.028 | 7.045 | 15.285 | 13.781 | 11.798 | 8.213 | 6.231 | | | | | | | | | |
| 9 bar | Start | 13.400 | 12.480 | 11.276 | | 17.516 | 16.312 | 14.090 | 12.878 | | | | | | | | | |
| | Run | 6.151 | 5.523 | 4.691 | | 8.045 | 7.213 | 5.691 | 4.841 | | | | | | | | | |
| | End | 11.453 | 9.939 | 7.957 | | 14.975 | 12.993 | 9.399 | 7.426 | | | | | | | | | |
| 9,5 bar | Start | 14.312 | 13.400 | 12.187 | | | 17.507 | 15.276 | 14.073 | | | | | | | | | |
| | Run | 6.612 | 5.983 | 5.151 | | | 7.815 | 6.293 | 5.443 | | | | | | | | | |
| | End | 12.364 | 10.851 | 8.877 | | | 14.188 | 10.594 | 8.621 | | | | | | | | | |
| 10 bar | Start | 15.223 | 14.312 | 13.108 | | | | 16.471 | 15.268 | | | | | | | | | |
| | Run | 7.063 | 6.434 | 5.603 | | | | 6.895 | 6.054 | | | | | | | | | |
| | End | 13.276 | 11.771 | 9.789 | | | | 11.789 | 9.807 | | | | | | | | | |
| 10,5 bar | Start | 16.144 | 15.223 | 14.020 | | | | | 17.666 | 16.462 | | | | | | | | |
| | Run | 7.523 | 6.895 | 6.063 | | | | | 7.497 | 6.656 | | | | | | | | |
| | End | 14.188 | 12.683 | 10.701 | | | | | 12.984 | 11.001 | | | | | | | | |
| 11 bar | Start | 17.055 | 16.135 | 14.931 | | | | | | 17.657 | | | | | | | | |
| | Run | 7.983 | 7.355 | 6.523 | | | | | | 7.258 | | | | | | | | |
| | End | 15.099 | 13.595 | 11.612 | | | | | | 12.196 | | | | | | | | |
| 11,5 bar | Start | | 17.047 | 15.843 | | | | | | | | | | | | | | |
| | Run | | 7.806 | 6.983 | | | | | | | | | | | | | | |
| | End | | 14.506 | 12.524 | | | | | | | | | | | | | | |
| 12 bar | Start | | | 16.754 | | | | | | | | | | | | | | |
| | Run | | | 7.443 | | | | | | | | | | | | | | |
| | End | | | 13.444 | | | | | | | | | | | | | | |
| Spring | Start | 4.992 | 6.496 | 8.479 | 4.992 | 6.496 | 8.479 | 12.064 | 14.046 | 4.992 | 6.496 | 8.479 | 12.064 | 14.046 | 6.496 | 8.479 | 12.064 | 14.046 |
| | Run | 2.027 | 2.638 | 3.443 | 2.027 | 2.638 | 3.443 | 4.912 | 5.718 | 2.027 | 2.638 | 3.443 | 4.912 | 5.718 | 2.638 | 3.443 | 4.912 | 5.718 |
| | End | 3.036 | 3.956 | 5.160 | 3.036 | 3.956 | 5.160 | 7.382 | 8.585 | 3.036 | 3.956 | 5.160 | 7.382 | 8.585 | 3.956 | 5.160 | 7.382 | 8.585 |

OUTPUT TORQUE (Lb-In)

SPRING RETURN TORQUE

| Supply pressure | AT-HDC 065 SR - P225 | | | AT-HDC 065 SR - P250 | | | | | AT-HDC 065 SR - P280 | | | | | AT-HDC 065 SR - P330 | | | | |
|-----------------|----------------------|--------|--------|----------------------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|
| | SC02 | SC04 | SC06 | SC02 | SC04 | SC06 | SC08 | SC10 | SC02 | SC04 | SC06 | SC08 | SC10 | SC04 | SC06 | SC08 | SC10 | |
| 2,5 bar | Start | | | 5.965 | | | | | 8.771 | 6.638 | | | | 12.010 | 9.674 | | | |
| | Run | | | 2.115 | | | | | 3.540 | 2.036 | | | | 4.806 | 3.169 | | | |
| | End | | | 3.054 | | | | | 5.859 | 2.487 | | | | 7.859 | 4.169 | | | |
| 3 bar | Start | 5.664 | | 8.169 | 6.036 | | | | 11.533 | 9.399 | | | | 15.843 | 13.506 | 10.639 | | |
| | Run | 1.956 | | 3.239 | 1.708 | | | | 4.939 | 3.478 | | | | 6.735 | 5.142 | 3.080 | | |
| | End | 2.744 | | 5.257 | 1.885 | | | | 8.621 | 5.248 | | | | 11.701 | 8.010 | 3.487 | | |
| 3,5 bar | Start | 7.443 | | 10.373 | 8.240 | | | | 14.294 | 12.161 | 9.824 | | | 19.684 | 17.347 | 14.480 | | |
| | Run | 2.876 | | 4.355 | 2.885 | | | | 6.319 | 4.877 | 3.248 | | | 8.665 | 7.089 | 5.107 | | |
| | End | 4.532 | | 7.461 | 4.089 | | | | 11.382 | 8.010 | 4.319 | | | 15.533 | 11.851 | 7.320 | | |
| 4 bar | Start | 9.231 | 7.089 | 12.577 | 10.444 | 8.107 | | | 17.064 | 14.922 | 12.586 | | | 23.525 | 21.189 | 18.321 | 15.082 | |
| | Run | 3.779 | 2.283 | 5.461 | 4.009 | 2.328 | | | 7.709 | 6.275 | 4.673 | | | 10.594 | 9.019 | 7.072 | 4.779 | |
| | End | 6.311 | 2.938 | 9.665 | 6.293 | 2.602 | | | 14.143 | 10.771 | 7.089 | | | 19.374 | 15.684 | 11.161 | 6.054 | |
| 4,5 bar | Start | 11.010 | 8.877 | 14.781 | 12.639 | 10.302 | | | 19.826 | 17.684 | 15.347 | 12.480 | | 27.358 | 25.021 | 22.153 | 18.914 | |
| | Run | 4.673 | 3.213 | 6.567 | 5.125 | 3.505 | | | 9.090 | 7.665 | 6.080 | 4.071 | | 12.515 | 10.948 | 9.019 | 6.780 | |
| | End | 8.098 | 4.726 | 11.869 | 8.497 | 4.806 | | | 16.905 | 13.533 | 9.851 | 5.328 | | 23.216 | 19.525 | 15.002 | 9.886 | |
| 5 bar | Start | 12.798 | 10.665 | 8.320 | 16.985 | 14.843 | 12.506 | 9.638 | | 22.587 | 20.454 | 18.109 | 15.241 | 12.010 | 31.199 | 28.862 | 25.995 | 22.755 |
| | Run | 5.567 | 4.124 | 2.452 | 7.674 | 6.231 | 4.638 | 2.487 | | 10.479 | 9.045 | 7.479 | 5.505 | 2.974 | 14.436 | 12.878 | 10.948 | 8.745 |
| | End | 9.886 | 6.514 | 2.823 | 14.064 | 10.701 | 7.010 | 2.487 | | 19.675 | 16.303 | 12.612 | 8.090 | 2.974 | 27.048 | 23.366 | 18.834 | 13.728 |
| 5,5 bar | Start | 14.586 | 12.444 | 10.108 | 19.188 | 17.047 | 14.710 | 11.842 | | 25.349 | 23.216 | 20.879 | 18.011 | 14.772 | 35.040 | 32.704 | 29.836 | 26.596 |
| | Run | 6.470 | 5.027 | 3.399 | 8.771 | 7.346 | 5.753 | 3.735 | | 11.860 | 10.435 | 8.868 | 6.912 | 4.620 | 16.356 | 14.798 | 12.878 | 10.683 |
| | End | 11.665 | 8.293 | 4.611 | 16.268 | 12.896 | 9.214 | 4.691 | | 22.437 | 19.065 | 15.374 | 10.851 | 5.744 | 30.889 | 27.198 | 22.676 | 17.569 |
| 6 bar | Start | 16.365 | 14.232 | 11.895 | 21.392 | 19.250 | 16.914 | 14.046 | | 28.110 | 25.977 | 23.640 | 20.773 | 17.533 | | | 33.668 | 30.429 |
| | Run | 7.364 | 5.921 | 4.319 | 9.877 | 8.452 | 6.868 | 4.886 | | 13.241 | 11.825 | 10.258 | 8.311 | 6.072 | | | 14.807 | 12.621 |
| | End | 13.453 | 10.081 | 6.390 | 18.472 | 15.099 | 11.417 | 6.886 | | 25.198 | 21.826 | 18.135 | 13.612 | 8.506 | | | 26.517 | 21.401 |
| 6,5 bar | Start | 18.153 | 16.011 | 13.674 | 23.587 | 21.454 | 19.118 | 16.250 | 13.011 | | 30.871 | 28.738 | 26.402 | 23.534 | 20.295 | | | 34.270 |
| | Run | 8.258 | 6.824 | 5.231 | 10.975 | 9.550 | 7.983 | 6.019 | 3.655 | | 14.621 | 13.205 | 11.639 | 9.709 | 7.488 | | | 14.559 |
| | End | 15.232 | 11.860 | 8.178 | 20.675 | 17.303 | 13.612 | 9.090 | 3.983 | | 27.960 | 24.587 | 20.905 | 16.374 | 11.267 | | | 25.242 |
| 7 bar | Start | 19.932 | 17.799 | 15.462 | 25.791 | 23.658 | 21.321 | 18.454 | 15.214 | | 33.642 | 31.500 | 29.163 | 26.296 | 23.056 | | | |
| | Run | 9.152 | 7.718 | 6.134 | 12.081 | 10.656 | 9.090 | 7.143 | 4.850 | | 16.002 | 14.586 | 13.028 | 11.099 | 8.895 | | | |
| | End | 17.020 | 13.648 | 9.957 | 22.879 | 19.507 | 15.816 | 11.294 | 6.187 | | 30.721 | 27.349 | 23.667 | 19.144 | 14.028 | | | |
| 7,5 bar | Start | 21.720 | 19.578 | 17.241 | 27.995 | 25.862 | 23.525 | 20.658 | 17.418 | | | 34.261 | 31.925 | 29.057 | 25.818 | | | |
| | Run | 10.046 | 8.612 | 7.036 | 13.188 | 11.763 | 10.196 | 8.258 | 6.010 | | | 15.967 | 14.409 | 12.488 | 10.293 | | | |
| | End | 18.808 | 15.436 | 11.745 | 25.083 | 21.711 | 18.020 | 13.497 | 8.391 | | | 30.119 | 26.428 | 21.906 | 16.790 | | | |
| 8 bar | Start | 23.499 | 21.366 | 19.029 | 30.199 | 28.066 | 25.729 | 22.861 | 19.622 | | | | 34.695 | 31.827 | 28.588 | | | |
| | Run | 10.931 | 9.506 | 7.939 | 14.285 | 12.869 | 11.302 | 9.373 | 7.143 | | | | 15.799 | 13.878 | 11.692 | | | |
| | End | 20.587 | 17.215 | 13.533 | 27.287 | 23.915 | 20.224 | 15.701 | 10.594 | | | | 29.190 | 24.667 | 19.560 | | | |
| 8,5 bar | Start | 25.287 | 23.154 | 20.817 | 32.403 | 30.261 | 27.924 | 25.056 | 21.826 | | | | | 34.589 | 31.349 | | | |
| | Run | 11.825 | 10.400 | 8.833 | 15.391 | 13.966 | 12.409 | 10.479 | 8.267 | | | | | 15.268 | 13.081 | | | |
| | End | 22.375 | 19.003 | 15.312 | 29.491 | 26.119 | 22.428 | 17.905 | 12.789 | | | | | 27.428 | 22.322 | | | |
| 9 bar | Start | 27.074 | 24.933 | 22.596 | 34.606 | 32.465 | 30.128 | 27.260 | 24.021 | | | | | | 34.111 | | | |
| | Run | 12.719 | 11.302 | 9.736 | 16.489 | 15.073 | 13.515 | 11.586 | 9.391 | | | | | | 14.480 | | | |
| | End | 24.154 | 20.782 | 17.100 | 31.686 | 28.322 | 24.632 | 20.109 | 14.993 | | | | | | 25.083 | | | |
| 9,5 bar | Start | 28.853 | 26.720 | 24.384 | | 34.668 | 32.332 | 29.464 | 26.225 | | | | | | | | | |
| | Run | 13.612 | 12.196 | 10.630 | | 16.170 | 14.613 | 12.692 | 10.506 | | | | | | | | | |
| | End | 25.942 | 22.569 | 18.879 | | 30.517 | 26.835 | 22.313 | 17.197 | | | | | | | | | |
| 10 bar | Start | 30.641 | 28.499 | 26.163 | | | 34.536 | 31.668 | 28.429 | | | | | | | | | |
| | Run | 14.506 | 13.081 | 11.524 | | | 15.719 | 13.798 | 11.612 | | | | | | | | | |
| | End | 27.721 | 24.357 | 20.666 | | | 29.039 | 24.508 | 19.401 | | | | | | | | | |
| 10,5 bar | Start | 32.420 | 30.287 | 27.951 | | | | 33.872 | 30.632 | | | | | | | | | |
| | Run | 15.400 | 13.975 | 12.418 | | | | 14.905 | 12.727 | | | | | | | | | |
| | End | 29.508 | 26.136 | 22.445 | | | | 26.712 | 21.605 | | | | | | | | | |
| 11 bar | Start | 34.208 | 32.075 | 29.730 | | | | | 32.836 | | | | | | | | | |
| | Run | 16.294 | 14.869 | 13.312 | | | | | 13.834 | | | | | | | | | |
| | End | 31.296 | 27.924 | 24.233 | | | | | 23.809 | | | | | | | | | |
| 11,5 bar | Start | | 33.854 | 31.518 | | | | | 35.040 | | | | | | | | | |
| | Run | | 15.763 | 14.205 | | | | | 14.940 | | | | | | | | | |
| | End | | 29.703 | 26.021 | | | | | 26.012 | | | | | | | | | |
| 12 bar | Start | | | 33.305 | | | | | | | | | | | | | | |
| | Run | | | 15.099 | | | | | | | | | | | | | | |
| | End | | | 27.800 | | | | | | | | | | | | | | |
| Spring | Start | 7.957 | 11.329 | 15.020 | 7.957 | 11.329 | 15.020 | 19.542 | 24.649 | 7.957 | 11.329 | 15.020 | 19.542 | 24.649 | 11.329 | 15.020 | 19.542 | 24.649 |
| | Run | 3.284 | 4.682 | 6.204 | 3.284 | 4.682 | 6.204 | 8.072 | 10.178 | 3.284 | 4.682 | 6.204 | 8.072 | 10.178 | 4.682 | 6.204 | 8.072 | 10.178 |
| | End | 5.045 | 7.178 | 9.515 | 5.045 | 7.178 | 9.515 | 12.382 | 15.622 | 5.045 | 7.178 | 9.515 | 12.382 | 15.622 | 7.178 | 9.515 | 12.382 | 15.622 |

OUTPUT TORQUE (Lb-In)

DOUBLE ACTING TORQUE

| Supply pressure | | AT-HDC 035 DA | | | | AT-HDC 045 DA | | | | AT-HDC 055 DA | | | | AT-HDC 065 DA | | | | |
|-----------------|-------|---------------|-------|-------|-------|---------------|-------|-------|-------|---------------|--------|--------|--------|---------------|--------|--------|--------|--------|
| | | 080 | 100 | 125 | 150 | 125 | 150 | 175 | 200 | 175 | 200 | 225 | 250 | 225 | 250 | 280 | 330 | |
| 2,5 bar | OPEN | Start | 611 | 947 | 1.487 | 2.133 | 1.903 | 2.744 | 3.735 | 4.877 | 4.567 | 5.965 | 7.550 | 9.320 | 8.922 | 11.010 | 13.816 | 19.188 |
| | | Run | 301 | 478 | 743 | 1.071 | 956 | 1.372 | 1.868 | 2.443 | 2.283 | 2.983 | 3.770 | 4.655 | 4.461 | 5.505 | 6.904 | 9.594 |
| | | End | 611 | 947 | 1.487 | 2.133 | 1.903 | 2.744 | 3.735 | 4.877 | 4.567 | 5.965 | 7.550 | 9.320 | 8.922 | 11.010 | 13.816 | 19.188 |
| 2,5 bar | CLOSE | Start | 584 | 920 | 1.460 | 2.106 | 1.876 | 2.717 | 3.708 | 4.850 | 4.505 | 5.903 | 7.488 | 9.258 | 8.851 | 10.940 | 13.745 | 19.118 |
| | | Run | 292 | 460 | 726 | 1.053 | 938 | 1.354 | 1.850 | 2.425 | 2.257 | 2.956 | 3.744 | 4.629 | 4.425 | 5.470 | 6.868 | 9.559 |
| | | End | 584 | 920 | 1.460 | 2.106 | 1.876 | 2.717 | 3.708 | 4.850 | 4.505 | 5.903 | 7.488 | 9.258 | 8.851 | 10.940 | 13.745 | 19.118 |
| 3 bar | OPEN | Start | 726 | 1.142 | 1.779 | 2.558 | 2.283 | 3.292 | 4.487 | 5.859 | 5.479 | 7.160 | 9.054 | 11.187 | 10.709 | 13.214 | 16.577 | 23.030 |
| | | Run | 363 | 566 | 894 | 1.283 | 1.142 | 1.646 | 2.239 | 2.930 | 2.744 | 3.576 | 4.532 | 5.594 | 5.355 | 6.612 | 8.293 | 11.515 |
| | | End | 726 | 1.142 | 1.779 | 2.558 | 2.283 | 3.292 | 4.487 | 5.859 | 5.479 | 7.160 | 9.054 | 11.187 | 10.709 | 13.214 | 16.577 | 23.030 |
| 3 bar | CLOSE | Start | 699 | 1.106 | 1.752 | 2.531 | 2.248 | 3.257 | 4.443 | 5.815 | 5.408 | 7.089 | 8.984 | 11.108 | 10.621 | 13.135 | 16.498 | 22.941 |
| | | Run | 354 | 558 | 876 | 1.266 | 1.124 | 1.629 | 2.222 | 2.912 | 2.708 | 3.540 | 4.496 | 5.558 | 5.310 | 6.567 | 8.249 | 11.471 |
| | | End | 699 | 1.106 | 1.752 | 2.531 | 2.248 | 3.257 | 4.443 | 5.815 | 5.408 | 7.089 | 8.984 | 11.108 | 10.621 | 13.135 | 16.498 | 22.941 |
| 3,5 bar | OPEN | Start | 850 | 1.328 | 2.080 | 2.992 | 2.673 | 3.841 | 5.231 | 6.833 | 6.390 | 8.346 | 10.568 | 13.046 | 12.488 | 15.418 | 19.339 | 26.862 |
| | | Run | 425 | 664 | 1.036 | 1.496 | 1.336 | 1.921 | 2.611 | 3.416 | 3.195 | 4.178 | 5.284 | 6.523 | 6.249 | 7.709 | 9.674 | 13.435 |
| | | End | 850 | 1.328 | 2.080 | 2.992 | 2.673 | 3.841 | 5.231 | 6.833 | 6.390 | 8.346 | 10.568 | 13.046 | 12.488 | 15.418 | 19.339 | 26.862 |
| 3,5 bar | CLOSE | Start | 814 | 1.292 | 2.045 | 2.956 | 2.629 | 3.797 | 5.187 | 6.789 | 6.311 | 8.267 | 10.488 | 12.966 | 12.391 | 15.321 | 19.242 | 26.765 |
| | | Run | 407 | 646 | 1.018 | 1.478 | 1.310 | 1.903 | 2.593 | 3.390 | 3.151 | 4.133 | 5.240 | 6.479 | 6.196 | 7.656 | 9.621 | 13.382 |
| | | End | 814 | 1.292 | 2.045 | 2.956 | 2.629 | 3.797 | 5.187 | 6.789 | 6.311 | 8.267 | 10.488 | 12.966 | 12.391 | 15.321 | 19.242 | 26.765 |
| 4 bar | OPEN | Start | 974 | 1.522 | 2.372 | 3.416 | 3.054 | 4.390 | 5.974 | 7.806 | 7.302 | 9.541 | 12.081 | 14.914 | 14.276 | 17.622 | 22.100 | 30.703 |
| | | Run | 487 | 761 | 1.186 | 1.708 | 1.522 | 2.195 | 2.992 | 3.903 | 3.655 | 4.771 | 6.036 | 7.452 | 7.134 | 8.806 | 11.055 | 15.356 |
| | | End | 974 | 1.522 | 2.372 | 3.416 | 3.054 | 4.390 | 5.974 | 7.806 | 7.302 | 9.541 | 12.081 | 14.914 | 14.276 | 17.622 | 22.100 | 30.703 |
| 4 bar | CLOSE | Start | 929 | 1.478 | 2.337 | 3.381 | 3.000 | 4.346 | 5.930 | 7.762 | 7.213 | 9.444 | 11.984 | 14.816 | 14.161 | 17.507 | 21.994 | 30.588 |
| | | Run | 469 | 743 | 1.168 | 1.690 | 1.496 | 2.168 | 2.965 | 3.877 | 3.602 | 4.726 | 5.992 | 7.408 | 7.081 | 8.753 | 10.993 | 15.294 |
| | | End | 929 | 1.478 | 2.337 | 3.381 | 3.000 | 4.346 | 5.930 | 7.762 | 7.213 | 9.444 | 11.984 | 14.816 | 14.161 | 17.507 | 21.994 | 30.588 |
| 4,5 bar | OPEN | Start | 1.097 | 1.708 | 2.673 | 3.841 | 3.434 | 4.939 | 6.727 | 8.780 | 8.222 | 10.736 | 13.586 | 16.772 | 16.055 | 19.826 | 24.871 | 34.544 |
| | | Run | 549 | 850 | 1.336 | 1.921 | 1.717 | 2.469 | 3.363 | 4.390 | 4.107 | 5.364 | 6.797 | 8.391 | 8.028 | 9.913 | 12.435 | 17.268 |
| | | End | 1.097 | 1.708 | 2.673 | 3.841 | 3.434 | 4.939 | 6.727 | 8.780 | 8.222 | 10.736 | 13.586 | 16.772 | 16.055 | 19.826 | 24.871 | 34.544 |
| 4,5 bar | CLOSE | Start | 1.053 | 1.664 | 2.629 | 3.797 | 3.372 | 4.886 | 6.665 | 8.727 | 8.116 | 10.630 | 13.480 | 16.666 | 15.931 | 19.702 | 24.738 | 34.412 |
| | | Run | 522 | 832 | 1.310 | 1.903 | 1.690 | 2.443 | 3.337 | 4.363 | 4.054 | 5.310 | 6.744 | 8.337 | 7.966 | 9.851 | 12.373 | 17.206 |
| | | End | 1.053 | 1.664 | 2.629 | 3.797 | 3.372 | 4.886 | 6.665 | 8.727 | 8.116 | 10.630 | 13.480 | 16.666 | 15.931 | 19.702 | 24.738 | 34.412 |
| 5 bar | OPEN | Start | 1.213 | 1.894 | 2.965 | 4.266 | 3.815 | 5.487 | 7.470 | | 9.134 | 11.931 | 15.099 | | 17.843 | 22.030 | 27.632 | |
| | | Run | 611 | 947 | 1.487 | 2.133 | 1.903 | 2.744 | 3.735 | | 4.567 | 5.965 | 7.550 | | 8.922 | 11.010 | 13.816 | |
| | | End | 1.213 | 1.894 | 2.965 | 4.266 | 3.815 | 5.487 | 7.470 | | 9.134 | 11.931 | 15.099 | | 17.843 | 22.030 | 27.632 | |
| 5 bar | CLOSE | Start | 1.168 | 1.850 | 2.921 | 4.222 | 3.753 | 5.426 | 7.408 | | 9.010 | 11.807 | 14.975 | | 17.701 | 21.888 | 27.490 | |
| | | Run | 584 | 920 | 1.460 | 2.106 | 1.876 | 2.717 | 3.708 | | 4.505 | 5.903 | 7.488 | | 8.851 | 10.940 | 13.745 | |
| | | End | 1.168 | 1.850 | 2.921 | 4.222 | 3.753 | 5.426 | 7.408 | | 9.010 | 11.807 | 14.975 | | 17.701 | 21.888 | 27.490 | |
| 5,5 bar | OPEN | Start | 1.336 | 2.089 | 3.266 | | 4.195 | 6.036 | 8.222 | | 10.046 | 13.126 | 16.604 | | 19.622 | 24.233 | 30.393 | |
| | | Run | 664 | 1.044 | 1.629 | | 2.098 | 3.018 | 4.107 | | 5.027 | 6.558 | 8.302 | | 9.815 | 12.117 | 15.197 | |
| | | End | 1.336 | 2.089 | 3.266 | | 4.195 | 6.036 | 8.222 | | 10.046 | 13.126 | 16.604 | | 19.622 | 24.233 | 30.393 | |
| 5,5 bar | CLOSE | Start | 1.283 | 2.036 | 3.204 | | 4.124 | 5.974 | 8.152 | | 9.913 | 12.993 | 16.471 | | 19.472 | 24.074 | 30.243 | |
| | | Run | 637 | 1.018 | 1.602 | | 2.062 | 2.983 | 4.071 | | 4.956 | 6.496 | 8.240 | | 9.736 | 12.037 | 15.117 | |
| | | End | 1.283 | 2.036 | 3.204 | | 4.124 | 5.974 | 8.152 | | 9.913 | 12.993 | 16.471 | | 19.472 | 24.074 | 30.243 | |
| 6 bar | OPEN | Start | 1.460 | 2.275 | 3.558 | | 4.576 | 6.585 | | | 10.957 | 14.312 | | | 21.410 | 26.428 | 33.155 | |
| | | Run | 726 | 1.142 | 1.779 | | 2.283 | 3.292 | | | 5.479 | 7.160 | | | 10.709 | 13.214 | 16.577 | |
| | | End | 1.460 | 2.275 | 3.558 | | 4.576 | 6.585 | | | 10.957 | 14.312 | | | 21.410 | 26.428 | 33.155 | |
| 6 bar | CLOSE | Start | 1.398 | 2.222 | 3.496 | | 4.496 | 6.514 | | | 10.816 | 14.170 | | | 21.242 | 26.260 | 32.987 | |
| | | Run | 699 | 1.106 | 1.752 | | 2.248 | 3.257 | | | 5.408 | 7.089 | | | 10.621 | 13.135 | 16.498 | |
| | | End | 1.398 | 2.222 | 3.496 | | 4.496 | 6.514 | | | 10.816 | 14.170 | | | 21.242 | 26.260 | 32.987 | |
| 6,5 bar | OPEN | Start | 1.575 | 2.469 | 3.859 | | 4.956 | 7.134 | | | 11.869 | 15.507 | | | 23.198 | 28.632 | | |
| | | Run | 788 | 1.230 | 1.929 | | 2.478 | 3.567 | | | 5.939 | 7.753 | | | 11.594 | 14.321 | | |
| | | End | 1.575 | 2.469 | 3.859 | | 4.956 | 7.134 | | | 11.869 | 15.507 | | | 23.198 | 28.632 | | |
| 6,5 bar | CLOSE | Start | 1.513 | 2.407 | 3.788 | | 4.877 | 7.054 | | | 11.718 | 15.356 | | | 23.012 | 28.455 | | |
| | | Run | 761 | 1.204 | 1.894 | | 2.434 | 3.531 | | | 5.859 | 7.674 | | | 11.506 | 14.223 | | |
| | | End | 1.513 | 2.407 | 3.788 | | 4.877 | 7.054 | | | 11.718 | 15.356 | | | 23.012 | 28.455 | | |
| 7 bar | OPEN | Start | 1.699 | 2.655 | 4.151 | | 5.337 | 7.682 | | | 12.789 | 16.701 | | | 24.977 | 30.836 | | |
| | | Run | 850 | 1.328 | 2.080 | | 2.673 | 3.841 | | | 6.390 | 8.346 | | | 12.488 | 15.418 | | |
| | | End | 1.699 | 2.655 | 4.151 | | 5.337 | 7.682 | | | 12.789 | 16.701 | | | 24.977 | 30.836 | | |
| 7 bar | CLOSE | Start | 1.629 | 2.584 | 4.080 | | 5.248 | 7.594 | | | 12.621 | 16.533 | | | 24.782 | 30.641 | | |
| | | Run | 814 | 1.292 | 2.045 | | 2.629 | 3.797 | | | 6.311 | 8.267 | | | 12.391 | 15.321 | | |
| | | End | 1.629 | 2.584 | 4.080 | | 5.248 | 7.594 | | | 12.621 | 16.533 | | | 24.782 | 30.641 | | |

OUTPUT TORQUE (Lb-In)

DOUBLE ACTING TORQUE

| Supply pressure | | | ATHDC 035 DA | | | | ATHDC 045 DA | | | | ATHDC 055 DA | | | | ATHDC 065 DA | | | |
|-----------------|-------|-------|--------------|-------|-----|-----|--------------|-------|-----|--------|--------------|-----|-----|--------|--------------|--------|-----|-----|
| | | | 080 | 100 | 125 | 150 | 125 | 150 | 175 | 200 | 175 | 200 | 225 | 250 | 225 | 250 | 280 | 330 |
| 7,5 bar | OPEN | Start | 1.823 | 2.850 | | | 5.718 | 8.231 | | | 13.701 | | | | 26.765 | 33.040 | | |
| | | Run | 912 | 1.425 | | | 2.859 | 4.116 | | | 6.850 | | | | 13.382 | 16.524 | | |
| | | End | 1.823 | 2.850 | | | 5.718 | 8.231 | | | 13.701 | | | | 26.765 | 33.040 | | |
| | CLOSE | Start | 1.752 | 2.770 | | | 5.629 | 8.143 | | | 13.524 | | | | 26.552 | 32.827 | | |
| | | Run | 876 | 1.390 | | | 2.815 | 4.071 | | | 6.762 | | | | 13.276 | 16.418 | | |
| | | End | 1.752 | 2.770 | | | 5.629 | 8.143 | | | 13.524 | | | | 26.552 | 32.827 | | |
| 8 bar | OPEN | Start | 1.947 | 3.036 | | | 6.098 | 8.780 | | | 14.613 | | | | 28.544 | 35.244 | | |
| | | Run | 974 | 1.522 | | | 3.054 | 4.390 | | | 7.302 | | | | 14.276 | 17.622 | | |
| | | End | 1.947 | 3.036 | | | 6.098 | 8.780 | | | 14.613 | | | | 28.544 | 35.244 | | |
| | CLOSE | Start | 1.868 | 2.956 | | | 6.001 | 8.683 | | | 14.418 | | | | 28.322 | 35.014 | | |
| | | Run | 929 | 1.478 | | | 3.000 | 4.346 | | | 7.213 | | | | 14.161 | 17.507 | | |
| | | End | 1.868 | 2.956 | | | 6.001 | 8.683 | | | 14.418 | | | | 28.322 | 35.014 | | |
| 8,5 bar | OPEN | Start | 2.062 | 3.231 | | | 6.479 | | | 15.524 | | | | 30.332 | | | | |
| | | Run | 1.036 | 1.611 | | | 3.239 | | | | 7.762 | | | | 15.161 | | | |
| | | End | 2.062 | 3.231 | | | 6.479 | | | | 15.524 | | | | 30.332 | | | |
| | CLOSE | Start | 1.983 | 3.142 | | | 6.373 | | | | 15.321 | | | | 30.093 | | | |
| | | Run | 991 | 1.575 | | | 3.186 | | | | 7.665 | | | | 15.046 | | | |
| | | End | 1.983 | 3.142 | | | 6.373 | | | | 15.321 | | | | 30.093 | | | |
| 9 bar | OPEN | Start | 2.186 | 3.416 | | | 6.859 | | | 16.436 | | | | 32.119 | | | | |
| | | Run | 1.097 | 1.708 | | | 3.434 | | | | 8.222 | | | | 16.055 | | | |
| | | End | 2.186 | 3.416 | | | 6.859 | | | | 16.436 | | | | 32.119 | | | |
| | CLOSE | Start | 2.098 | 3.328 | | | 6.753 | | | | 16.223 | | | | 31.863 | | | |
| | | Run | 1.053 | 1.664 | | | 3.372 | | | | 8.116 | | | | 15.931 | | | |
| | | End | 2.098 | 3.328 | | | 6.753 | | | | 16.223 | | | | 31.863 | | | |
| 9,5 bar | OPEN | Start | 2.310 | 3.602 | | | 7.240 | | | 17.356 | | | | 33.898 | | | | |
| | | Run | 1.151 | 1.806 | | | 3.620 | | | | 8.674 | | | | 16.949 | | | |
| | | End | 2.310 | 3.602 | | | 7.240 | | | | 17.356 | | | | 33.898 | | | |
| | CLOSE | Start | 2.213 | 3.514 | | | 7.125 | | | | 17.126 | | | | 33.633 | | | |
| | | Run | 1.106 | 1.752 | | | 3.567 | | | | 8.559 | | | | 16.816 | | | |
| | | End | 2.213 | 3.514 | | | 7.125 | | | | 17.126 | | | | 33.633 | | | |
| 10 bar | OPEN | Start | 2.425 | 3.797 | | | 7.620 | | | | | | | | | | | |
| | | Run | 1.213 | 1.894 | | | 3.815 | | | | | | | | | | | |
| | | End | 2.425 | 3.797 | | | 7.620 | | | | | | | | | | | |
| | CLOSE | Start | 2.328 | 3.700 | | | 7.497 | | | | | | | | | | | |
| | | Run | 1.168 | 1.850 | | | 3.753 | | | | | | | | | | | |
| | | End | 2.328 | 3.700 | | | 7.497 | | | | | | | | | | | |
| 10,5 bar | OPEN | Start | 2.549 | 3.983 | | | 8.010 | | | | | | | | | | | |
| | | Run | 1.275 | 1.991 | | | 4.001 | | | | | | | | | | | |
| | | End | 2.549 | 3.983 | | | 8.010 | | | | | | | | | | | |
| | CLOSE | Start | 2.452 | 3.885 | | | 7.877 | | | | | | | | | | | |
| | | Run | 1.221 | 1.938 | | | 3.939 | | | | | | | | | | | |
| | | End | 2.452 | 3.885 | | | 7.877 | | | | | | | | | | | |
| 11 bar | OPEN | Start | 2.673 | 4.178 | | | 8.391 | | | | | | | | | | | |
| | | Run | 1.336 | 2.089 | | | 4.195 | | | | | | | | | | | |
| | | End | 2.673 | 4.178 | | | 8.391 | | | | | | | | | | | |
| | CLOSE | Start | 2.567 | 4.071 | | | 8.249 | | | | | | | | | | | |
| | | Run | 1.283 | 2.036 | | | 4.124 | | | | | | | | | | | |
| | | End | 2.567 | 4.071 | | | 8.249 | | | | | | | | | | | |
| 11,5 bar | OPEN | Start | 2.797 | 4.363 | | | 8.771 | | | | | | | | | | | |
| | | Run | 1.398 | 2.186 | | | 4.381 | | | | | | | | | | | |
| | | End | 2.797 | 4.363 | | | 8.771 | | | | | | | | | | | |
| | CLOSE | Start | 2.682 | 4.257 | | | 8.621 | | | | | | | | | | | |
| | | Run | 1.336 | 2.124 | | | 4.310 | | | | | | | | | | | |
| | | End | 2.682 | 4.257 | | | 8.621 | | | | | | | | | | | |
| 12 bar | OPEN | Start | 2.912 | 4.558 | | | | | | | | | | | | | | |
| | | Run | 1.460 | 2.275 | | | | | | | | | | | | | | |
| | | End | 2.912 | 4.558 | | | | | | | | | | | | | | |
| | CLOSE | Start | 2.797 | 4.434 | | | | | | | | | | | | | | |
| | | Run | 1.398 | 2.222 | | | | | | | | | | | | | | |
| | | End | 2.797 | 4.434 | | | | | | | | | | | | | | |



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