REDUCING CONSUMPTION SET (INCREASED TORQUE AND ROUND WITHOUT INCREASING CONSUMPTION)

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IN THE NAME OF GOD

PROJECT SUMMARY:

THE IDEA PRESENTED IN THIS ARTICLE IS TO EXAMINE HYDROMOTORS AND HYDROPUMPS IN ORDER TO MAXIMIZE THE MAXIMUM OUTPUT POWER IN TERMS OF THEIR INPUT POWER, WHICH MAKES THEM BETTER IN INPUT POWER. THE MAIN ISSUE IN THIS CASE IS THE PRESSURE AND DISCHARGE IN THE HYDRAULIC PUMP AND HYDRO MOTORS, WHICH WE WILL CONTINUE TO DISCUSS. THE ULTIMATE GOAL OF THIS DESIGN IS TO ASSUME CONSTANT POWER, INCREASE IN PRESSURE AND FLOW, AND ULTIMATELY EFFICIENCY IN FIXED AND ROTARY SYSTEMS.

INTRODUCTION:

THE EFFICIENCY IS USUALLY DEFINED AS THE RATIO BETWEEN "USEFUL OUTPUT" AND "TOTAL INPUT". ALL OF US KNOW VERY WELL THAT THERE IS NOT YET PROVIDED A SYSTEM WITH 100% EFFICIENCY. THERE ARE MANY WAYS TO IMPROVE THE EFFICIENCY. EACH OF THEM IS SPECIFIC TO A SPECIFIC SYSTEM AND CAN NOT BE CONSIDERED GENERIC FOR THEM.

SO FAR, WE HAVE HEARD THAT THE INVENTORS HAVE BEEN TRYING TO BUILD MACHINES THAT CAN BE STARTED AND USED WITHOUT FUEL. FOR EXAMPLE, SOME OF THEM HAVE DOCUMENTED SOURCES OUTSIDE AND INSIDE.

WE WILL POINT OUT:

IN 1994, AN INVENTORY OF TROY REED WAS LAUNCHED BEYOND THE LAW

WHICH MADE IT NECESSARY TO BUILD A NON-RIGID ELECTRIC MOTOR

(MOTORIZED MOTORS) THAT CAN POWER HOME AND ELECTRIC CAR UP

THE CEILING WAS 70 KW

TAKE A BREAK THROUGH ENERGY CONFERENCE

YOU SEE

THE US SPACE AGENCY (NASA) HAS CONFIRMED THE CONSTRUCTION OF AN ENGINE THAT CAN WORK WITHOUT FUEL. THIS EXHAUST MANIFOLD IS CALLED EM DRIVE. THIS EXHAUST ENGINE WAS TESTED IN AUGUST 2013 DURING AN EIGHT-DAY TRIAL PERIOD BY NASA. THIS IS A VIOLATION OF THE LAWS, BUT RESEARCHERS HAVE SUCCEEDED IN PRODUCING A SMALL AMOUNT OF LAUNCHING POWER INSIDE A CHAMBER WITHOUT USING FUEL.

IN THIS PAPER, THE MAIN GOAL IS TO INCREASE THE ROTATING POWER

IT'S FIXED THAT SOME OF THEM CAN BE MENTIONED

MADE

BASIC AND APPLIED FORMULAS:

MECHANICAL POWER: IF W IS THE AMOUNT OF WORK DONE IN TIME T. P $= W / t$

WORK: FORCE F AT DISPLACEMENT W = F $\times$ d

TORQUE: THE FORCE F DURING THE ARM IS d T = F $\times$ d

POWER: IN ROTATIONAL SYSTEMS, THE POWER EQUALS THE PRODUCT OF TORQUE T AND ANGULAR VELOCITY Ω P = T $\times$ Ω

ANGULAR VELOCITY: SPECIFIES THE ANGULAR FREQUENCY OF AN OBJECT AND THE DIRECTION IN WHICH THE SURROUNDING OBJECT IS LOCATED. SOMETIMES ANGULAR VELOCITIES ARE ALSO KNOWN AS ROTATIONAL VELOCITIES, IN WHICH CASE THEY ARE MEASURED IN TERMS OF THE NUMBER OF CIRCLES OR THE NUMBER OF ROTATIONS PER TIME (SUCH AS RPM). $\Omega = \emptyset / T$

PRESSURE: EQUAL TO THE FORCE APPLIED ON THE SURFACE. $P = F / A$

THE OVERALL REDUCTION OF CONSUMPTION IS DIVIDED INTO THREE MAIN PARTS:

GEAR

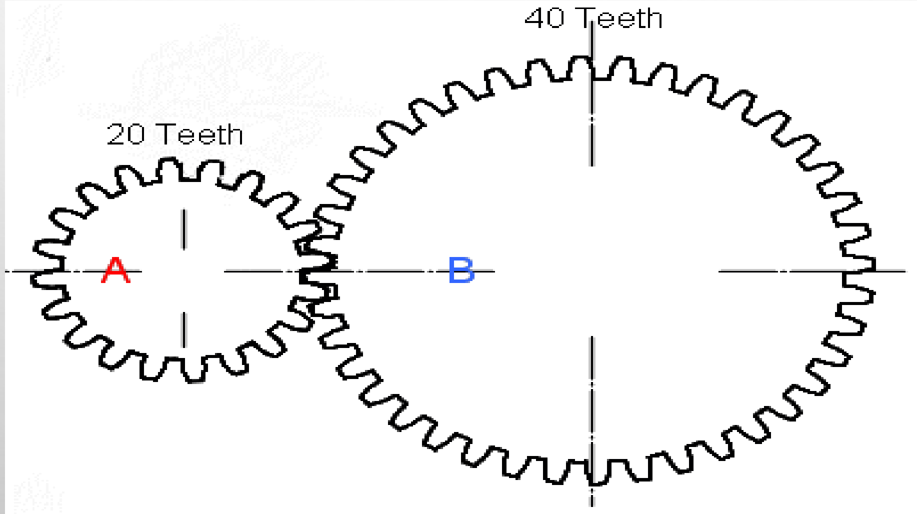
CAM AND FOLLOWERS

HYDRAULIC BASES (HYDROPUMP NEW ⟦^ 1⟧ AND HYDROMOTOR)

THE NEW HYDROPUMP, WHICH IS BASED ON IT, HAS CHANGED, WHICH WE WILL CONTINUE TO DISCUSS.

GEAR:

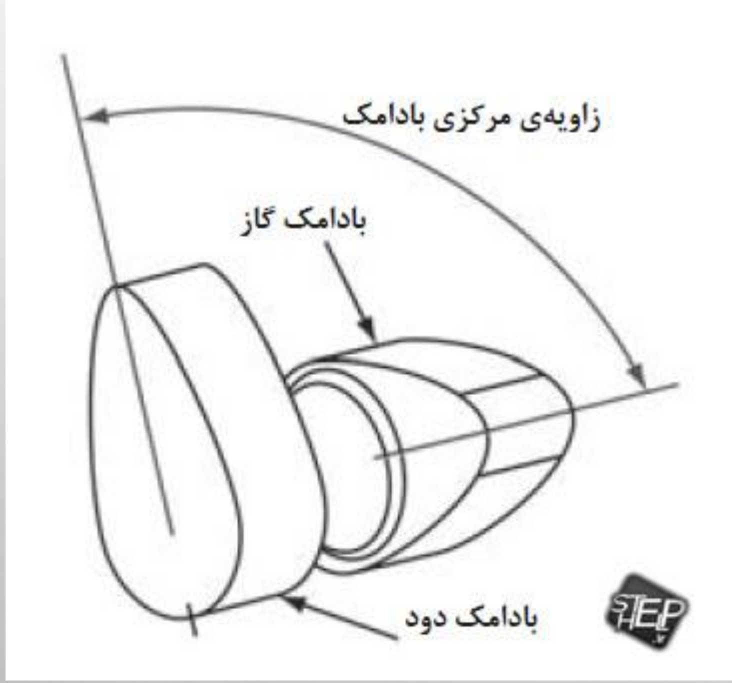
A GEAR IS A MECHANISM THAT IS DEFINED FOR THE TRANSMISSION OF ROTATIONAL POWER FROM ONE AXIS TO ANOTHER. THE POWER GIVEN TO THE GEAR WILL SUBSEQUENTLY DELIVER THE SAME TO US, BUT IT MAY BE DIFFERENT WITH A TORQUE OR A ROUND. FOR EXAMPLE, WE CAN DOUBLE THE TORQUE WITH A GEAR OF 1 TO 2, BUT WE ACTUALLY CUT IT BY HALF.



CAMSHAFT CAM:

CAMSHAFTS THAT HAVE ROTATIONAL MOTION, WHICH USUALLY TURN ROTATIONAL MOTION INTO LINEAR MOTION OR LINEAR MOTION INTO ROTATIONAL MOTION. CAMERAS ARE EASY TO CREATE ANY KIND OF FOLLOW-UP MOVES.

CAMS ARE ANGLES THAT ARE CENTER-TO-CENTER ANGLES.



HYDRAULIC:

HYDRAULICS FOLLOW THE RULES GOVERNING FLUIDS AND ITS FOUNDATION IS THE PASCAL ACT.

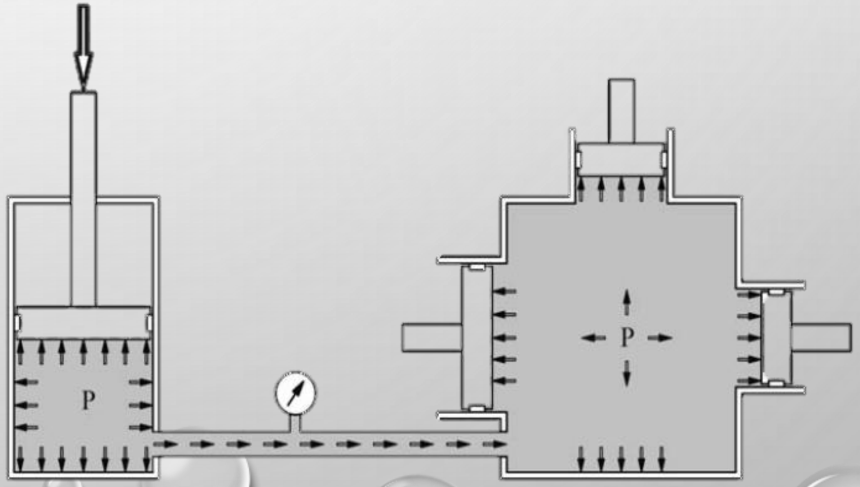
PASCAL'S LAW:

THE PRESSURE APPLIED TO ONE POINT OF THE FLUID IN ALL DIRECTIONS IS THE SAME

IN OTHER WORDS, THE PRESSURE ON A FLUID IS RELEASED IN ALL DIRECTIONS

AND PERPENDICULAR TO ALL LEVELS OF THE CONTAINER CONTAINING FLUID

IT TURNS OUT.



PRESSURE:

WHEN THE FORCE F IS APPLIED TO A SPECIFIC SURFACE A, IT CAUSES COMPRESSION OF THE COMPONENTS UNDER STRESS. THE AMOUNT OF FORCE IMPOSED ON A SURFACE IS DEFINED AS A PRESSURE THAT IS DISPLAYED WITH THE P SYMBOL:

$P = F / A$ (N / CM2)

THE MORE FORCE IT ENTERS, THE GREATER THE PRESSURE. IF THE FORCE ARRIVES AT A CERTAIN LEVEL, THE PRESSURE GOES UP TO A HIGHER LEVEL. IN HYDRAULIC JACKS, IT DECREASES

THE INITIAL LEVEL RELATIVE TO THE SECONDARY LEVEL CAN BE THE OUTPUT POWER TO THE SAME

THE RATE INCREASES, BUT IN TURN THE COURSE LEVEL DECREASES

THE WORK DONE WILL ALSO BE EQUAL. THIS IS THE SAME PRINCIPLE OF ENERGY SURVIVAL

IS CALLED

THE MAIN COMPONENTS OF THE HYDRAULIC SECTION IN THIS ARTICLE:

HYDROMOTOR 2-HYDROMOTOR

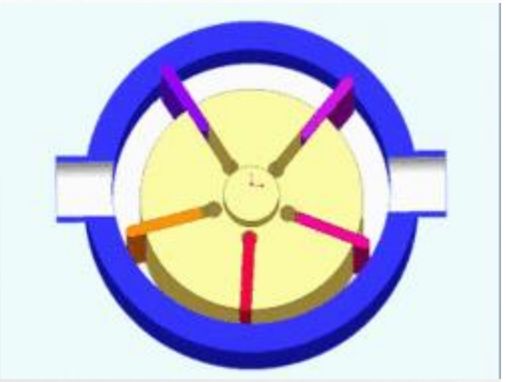
HYDRO PUMP

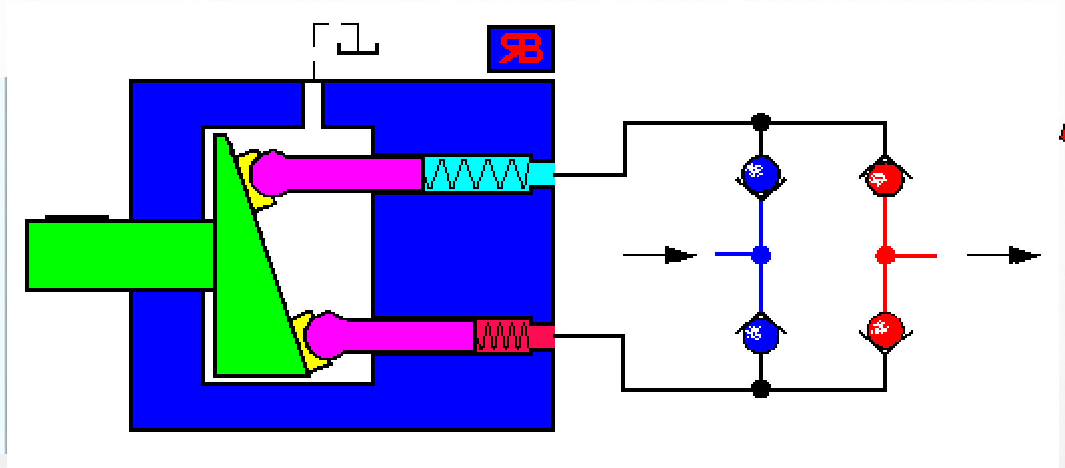
THE PUMP ACTUALLY MOVES ENERGY INTO THE FLUID BY CONVERTING MECHANICAL ENERGY TO THE HYDRAULIC ENERGY GENERATED BY THE OPERATORS INTO MECHANICAL ENERGY, CAUSING THE PUMP TO MOVE THE FLUID THROUGH THE VACUUM IN THE SUCTION NOZZLE. IN FACT, THE PUMP IS A FLUID FLOW, AND THE DIFFERENCE BETWEEN THE OUTPUT AND INPUT PRESSURE DEPENDS ONLY ON THE LOAD TIMES THAT THE HYDRAULIC SYSTEM OPERATOR OVERCOMES.

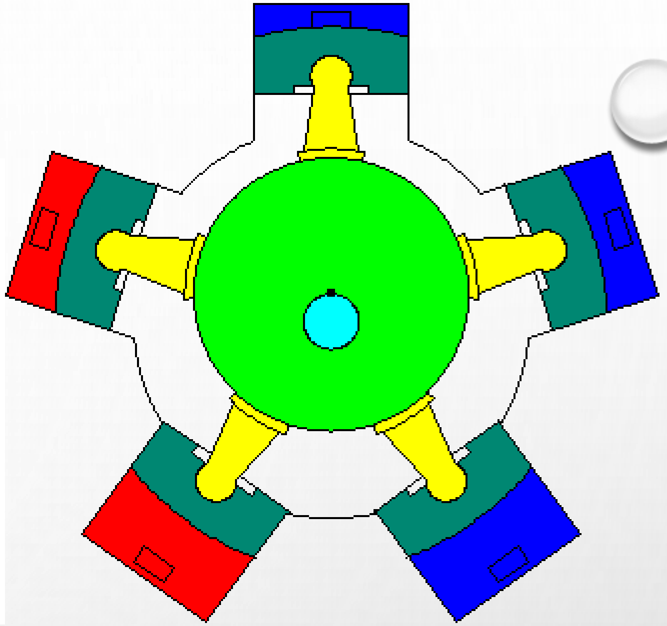
PUMP TYPES

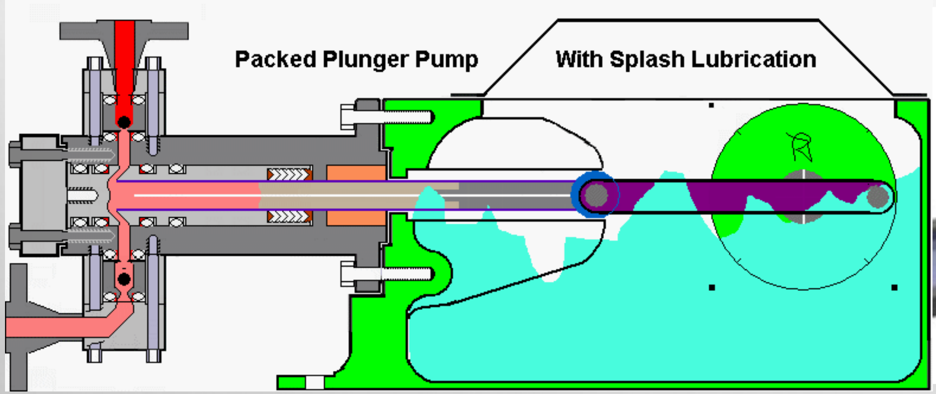
1. PISTON 2. PILLAR 3. PISTON

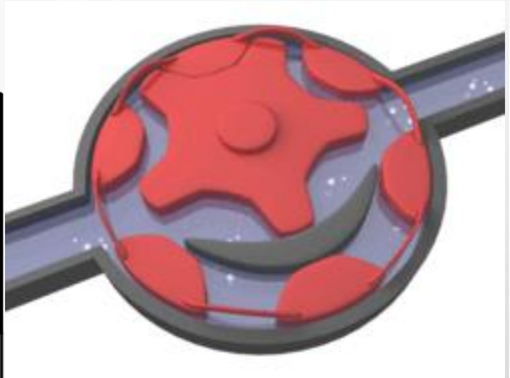
IN THIS DESIGN, WE WILL EXAMINE THE PISTON PUMP, WHICH WILL BE EASIER TO ANALYZE DUE TO THE PISTON.

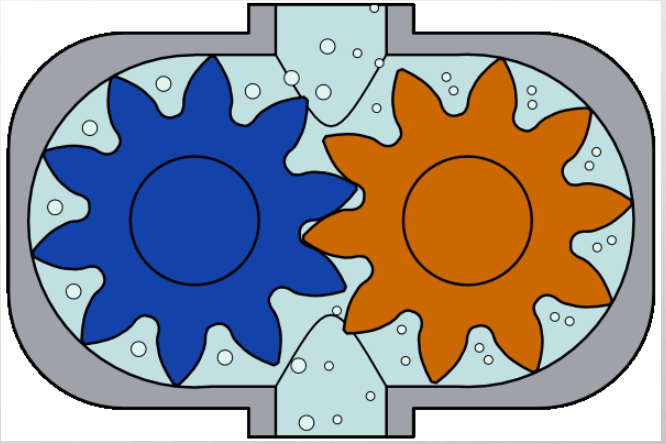


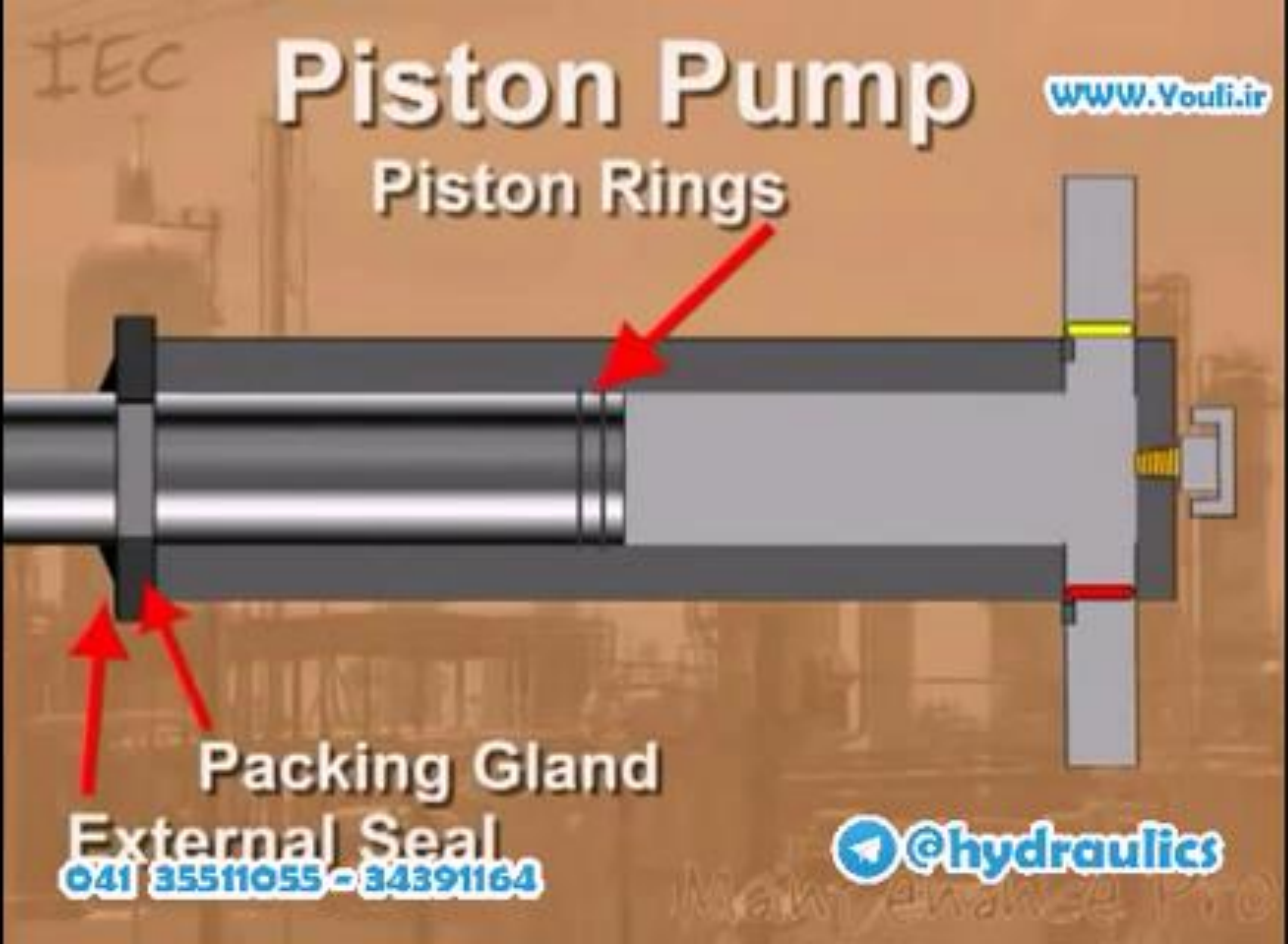





Packed Plunger Pump
With Splash Lubrication






IEC
Piston Pump
WWW.Youli.ir
Piston Rings
Packing Gland
External Seal
041 35511055 - 34391164
@hydraulics

PISTON PUMP:

IN THIS TYPE OF PUMP, THE PISTONS MOVE UPWARDS AND DOWNWARDS BY A BUNCH THAT IS PLACED ON A ROTARY WHEEL ON ONE SIDE. WHEN THE PISTON MOVES UPWARDS, THE OUTLET VALVE IS CLOSED DUE TO THE SUCTION AND THE FORCE GENERATED BY THE RETURN FLOW IN THE OUTLET AND IS SUCKED INTO THE PUMP CHAMBER DUE TO THE SUCTION FORCE GENERATED INSIDE THE CYLINDER, THE OPEN AND FLUID INLET VALVE. WHEN THE PISTON MOVES DOWNWARDS, THE INLET VALVE IS CLOSED AND THE OUTLET VALVE RETURNS AND THE CONDENSED FLUID PASSES THROUGH THE ENCLOSURE AND UNDER THE PRESSURE OF THE PISTON TO THE OUTLET.

THE PISTON PUMP IS DIVIDED INTO TWO CATEGORIES: 1-AXIAL PISTON PUMP 2-RADIAL PISTON PUMP

AXIAL PISTON PUMPS ARE DIVIDED INTO THE FOLLOWING: 1-CURVED SHAFT 2- ANGLE PLATE

HYDROMOTOR

HYDRAULIC MOTORS ARE CONSUMER AND STRUCTURALLY SIMILAR TO THE HYDRAULIC PUMP. HYDROMOTORS VARY IN TERMS OF PRESSURE, TORQUE AND PER-FLOW, AND ITS OUTLET.

FORMULA TORQUE IN A HYDRAULIC MOTOR:

IN THIS CONNECTION, ΔP IS THE DIFFERENCE BETWEEN THE INLET AND OUTLET PRESSURE AND VG THE DISPLACEMENT VOLUME ACCORDING TO WHICH THE HYDRAULIC MOTOR ROTATES ONE ROUND.

T (N.M) = 0.016 X ΔP (BAR) X VG (CM3)

SINCE THE MOVEMENTS IN THE CYLINDER ARE LINEAR AND IN THE ROTATIONAL HYDRAULIC MOTOR, INSTEAD OF THE FORCE F OF THE TORQUE T, INSTEAD OF THE PISTON SURFACE A, THE DISPLACEMENT VOLUME VG IS REPLACED.

$\Delta P = ((T)\ f)\ /\ ((vg)\ a \times .016)$

BY INCREASING THE DISPLACEMENT VOLUME (A) OR INCREASING THE COMPRESSOR OF THE HYDRAULIC MOTOR, THE TORQUE (F) CAN BE INCREASED.

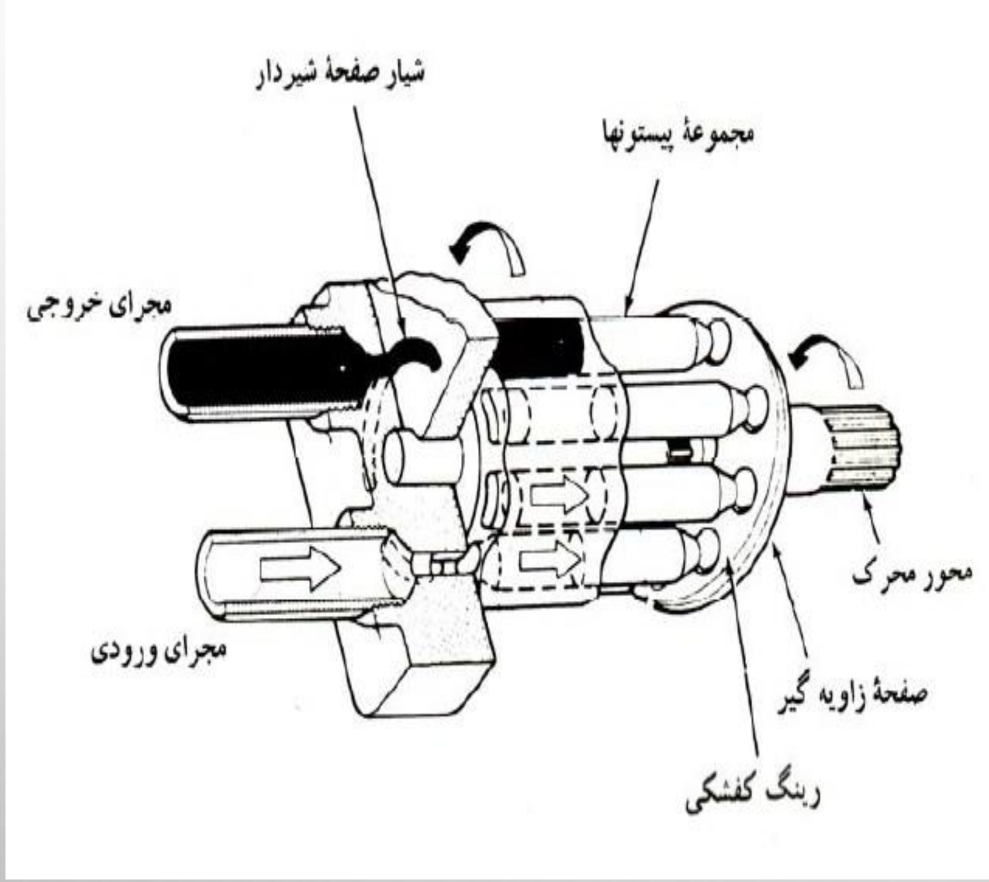
BASIC HYDRAULIC RULES:

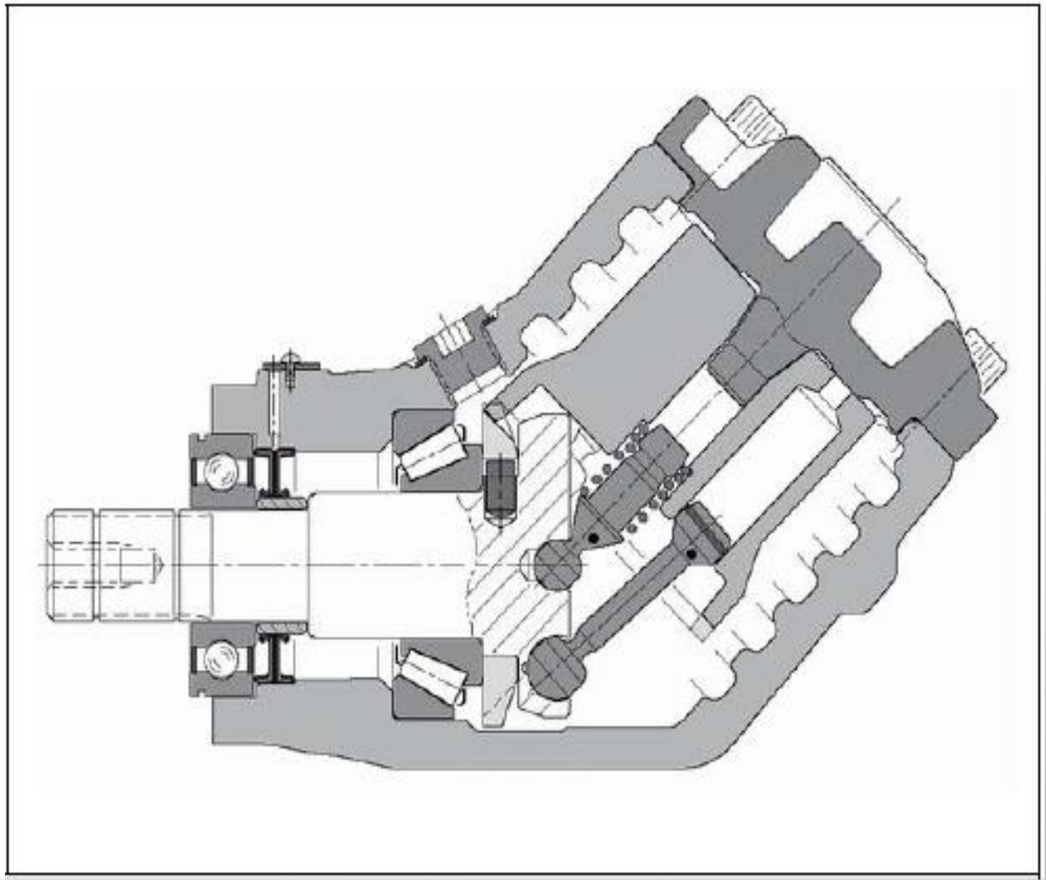
PRESSURIZED FLUID ALWAYS CHOOSES A LESS PASSIVE PATH FOR PASSAGE.

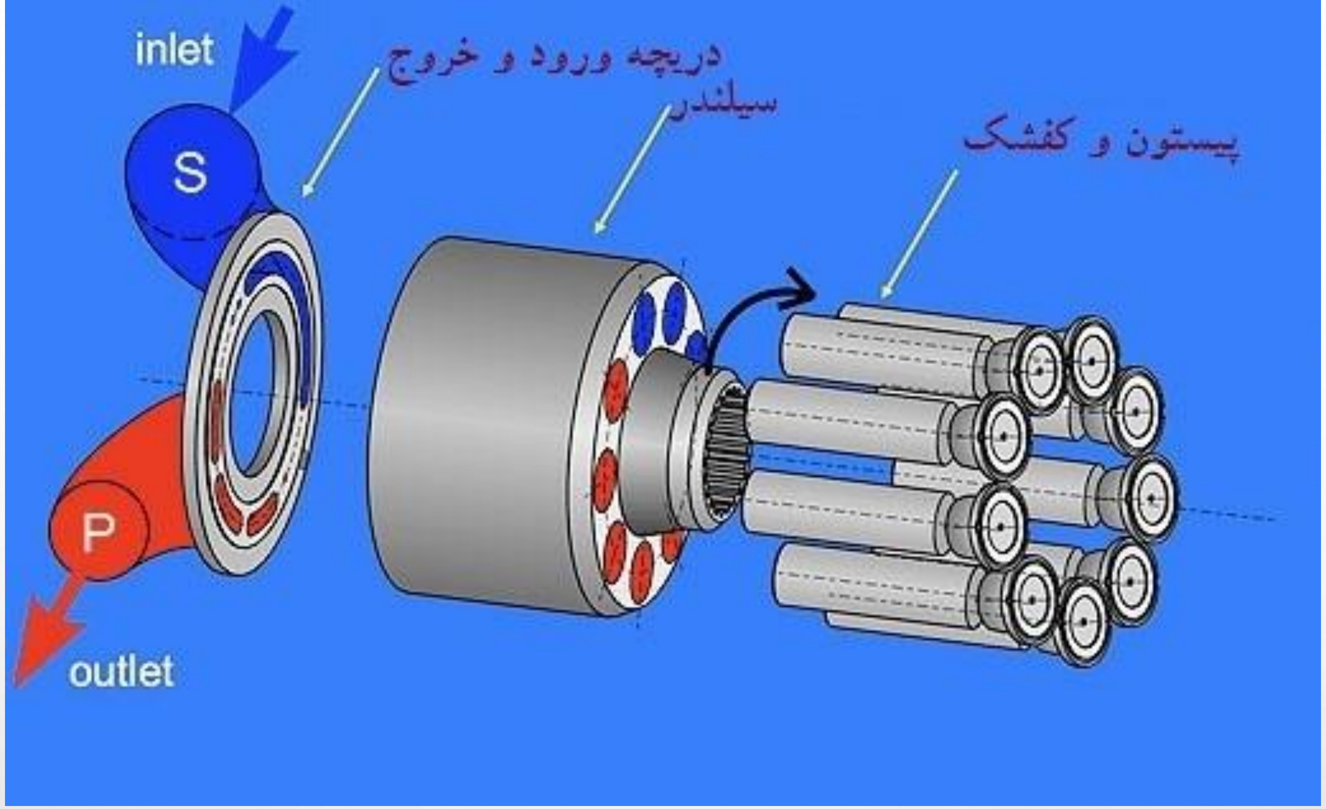
THE PUMP PRODUCES NO PRESSURE.

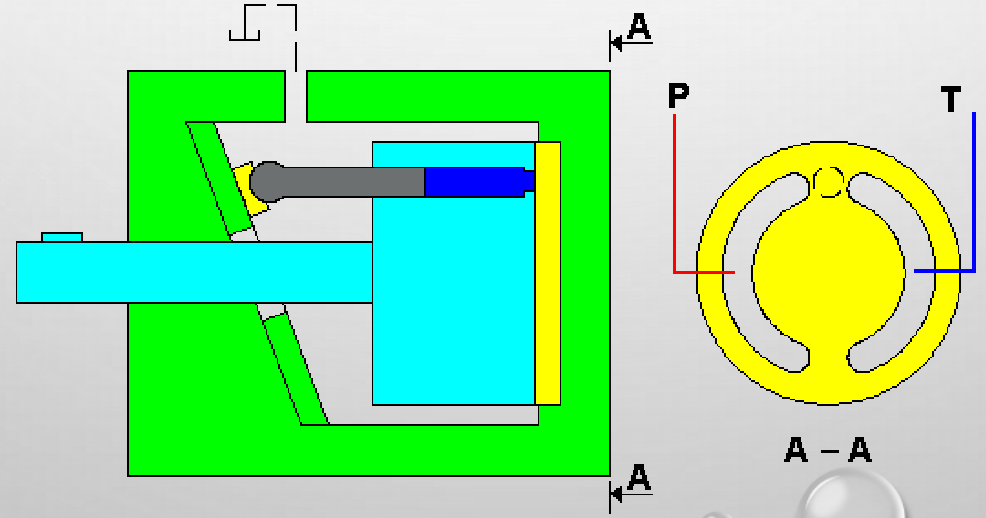
PRESSURE IS CREATED ONLY AGAINST THE RESISTANCE OF AN OBSTACLE.

IN FIGURE (A), THE PISTON PUMP IS CURVED AND IN THE FORM (B) THE PISTON PUMP IS FITTED WITH AN ANGLE PLATE.






inlet
S
دریچه ورود و خروج
سیلندر
پیستون و کفشک
P
outlet


A
P
T
A – A
A

FEATURES OF THE PISTON HYDRAULIC PUMP WITH AN ANGLED PLATE:

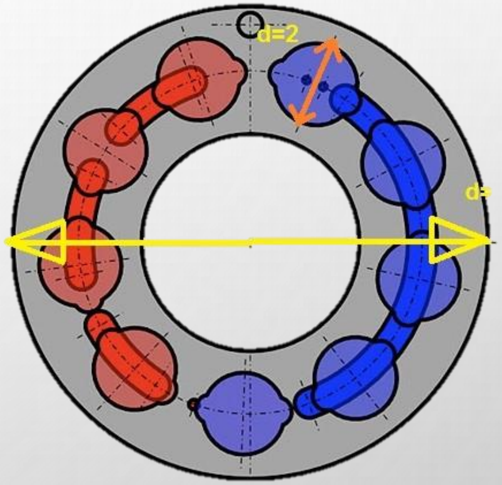
THE PISTON HYDROPUMP ALWAYS PUSHES HALF THE PISTONS AT ALL TIMES.

THE ANGLED PLATE SHOULD HOLD ALL THE PISTONS BELOW.

AS FAR AS THE ANGLE IS CONCERNED, THE ANGLED CORNER OF THE CURVE CHANGES.

IN THE SPECIFIED TIME, THE DISPLACED PISTONS ARE DISPLACED.

USUALLY THE PISTON LEVEL IS EQUAL TO THE COURSE SIZE.



OF COURSE, THESE ARE NOT THE DISADVANTAGES OF HYDROPUMPS BECAUSE THESE FEATURES ARE SIMILAR IN THE SAME HYDROMOTOR.

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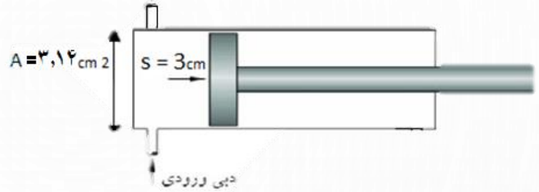
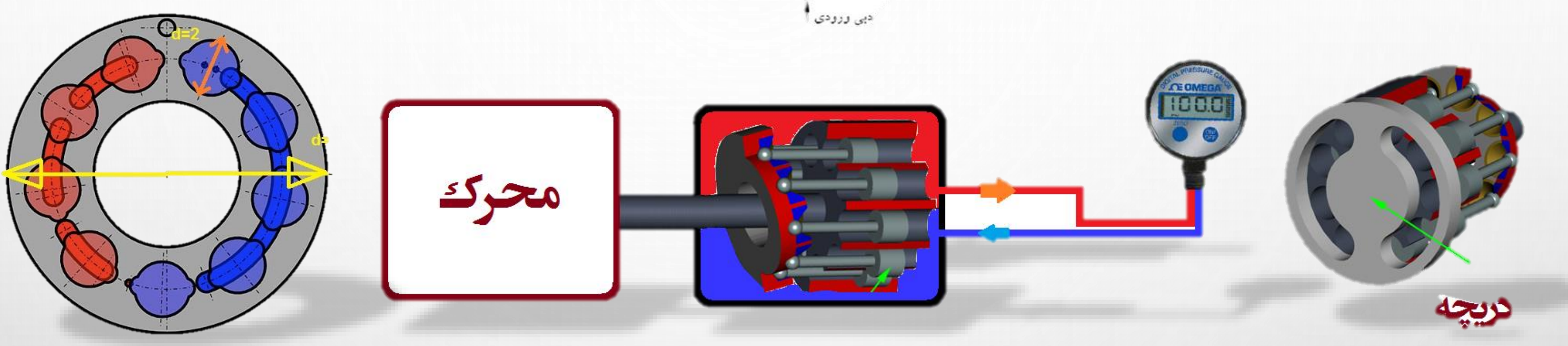
FOR EXAMPLE, THIS CAN BE ANALYZED MECHANICALLY AND USING BASIC FORMULAS.

FOR EXAMPLE, THE:





IN THE ABOVE FIGURE, THERE IS AN ACTUATOR WITH A POWER OF KW3 AND A ROUND OF 1500RPM AND A PUMP, THE VALUES OF WHICH ARE AS FOLLOWS.

T = 1500/60 = 25 RPM

THE DIAMETER IS BACK) D = 10 CM
(TO THE BACK OF THE PISTON

(PISTON DIAMETER) D = 2 CM

(COURSE LENGTH) S = 3CM

NUMBER OF) n_p = 9
(PISTONS

(ACTUATOR TORQUE)T = 120 NM

A= $\frac{2\times2\times3.14}{4}$ = 3.14 CM2

P = 191 N/ cm^2

v_g = 84.78 cm^3 /REV

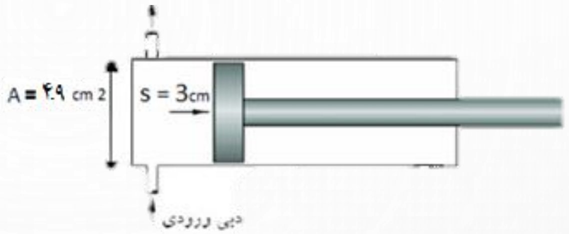
P = $T \times \omega \rightarrow$ T = $\frac{p}{\omega} = \frac{3000}{25} = 120nm$

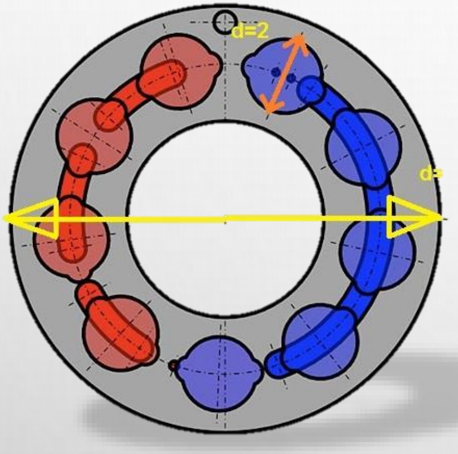
T = $f \times d \rightarrow f = \frac{120}{.05}$ =2400N

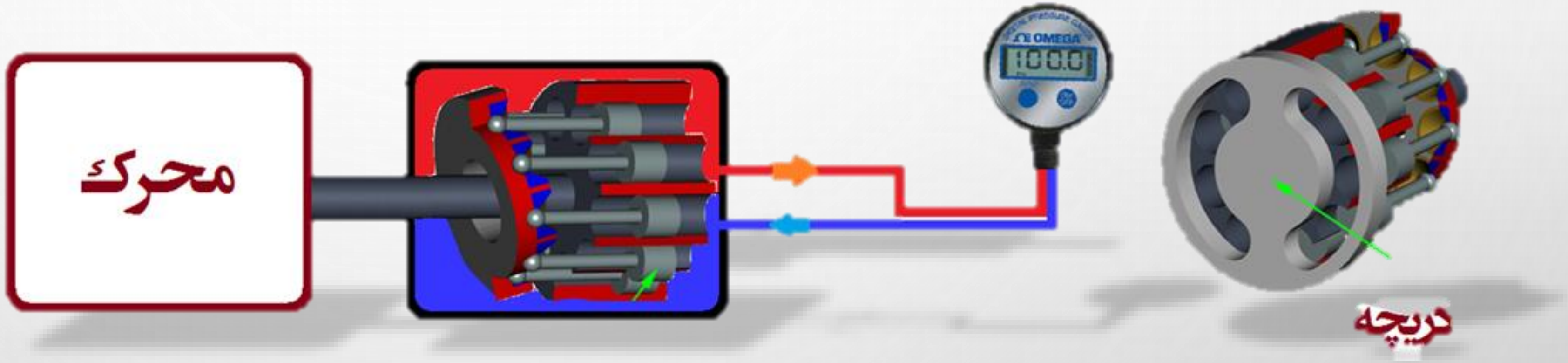
P = $\frac{f}{a} = \frac{2400}{3/14\times4}$ = 191 N/ cm^2

v_g = $A \times L$ =3.14 × 3 × 9 = 84.78 cm^3 /REV

FOR EXAMPLE: IN THE FOLLOWING FIGURE, THERE IS AN ACTUATOR WITH A POWER OF 1500 KPM AND A 1500RPM AND A HYDRAULIC PUMP, THE VALUES OF WHICH ARE AS FOLLOWS.







T = 1500/60 = 25 RPM

(ANGLED SCREEN DIAMETER)D = 10 CM

(PISTON DIAMETER) D = 2.5 CM

(QATAR COURSE LENGTH)S = 3 CM

(NUMBER OF PISTONS) n_p =9

(ACTUATOR TORQUE)T =120 NM

A= $\frac{2.5\times2.5\times3.14}{4}$ = 4.9 CM2

P = $T \times \omega \rightarrow$ T = $\frac{p}{\omega} = \frac{3000}{25} = 120nm$

T = $f \times d \rightarrow f = \frac{120}{.05}$ =2400

P = $\frac{f}{a} = \frac{2400}{4.9\times4}$ = 122.32 N/ cm^2

$v_g = A \times L$ =4.9 × 3 × 9 = 132/4 cm^3 /REV

N = $\frac{v_{g2}}{v_{g1}} \times 1500 = \frac{132/4}{84/78} \times 1500 = 2342rpm$

$v_{g\,1}$ = 84.78 cm^3 /REV → v_{g2} = 132.4 cm^3 /REV

P1= 191 N/ cm^2 → P2= 122.35 N/ cm^2

THE NEW SYSTEM HAS REPLACED THE HYDRAULIC PUMP WITH A CAMSHAFT THAT PUTS A NUMBER OF PISTONS AND HAS THE FOLLOWING FEATURES:

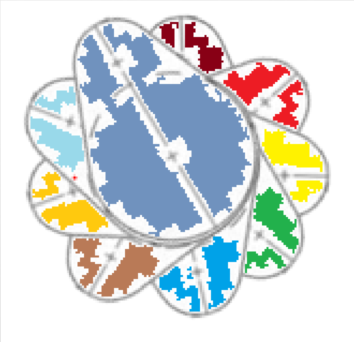
1 - A CAMSHAFT CAN BE INSERTED INTO THE PISTON FROM THE CLOSEST POSSIBLE DISTANCE.

2-CAM BECAUSE OF THE DISTINCTION OF THE REST OF THE PISTONS, IT PUTS ALL THE FORCE FROM THE TORQUE INTO THE PISTON.

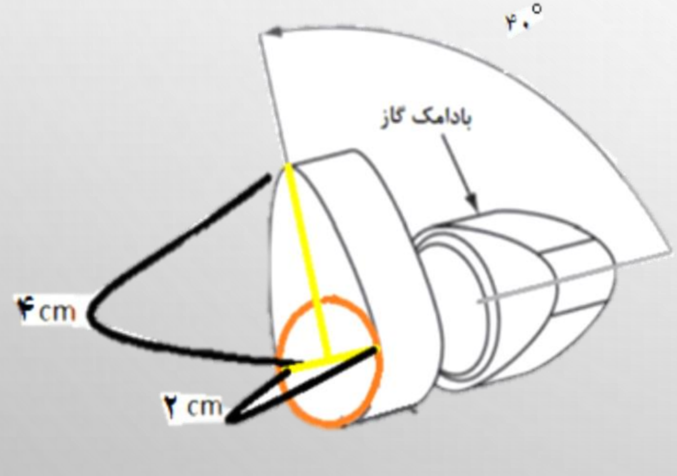
3-CAMSHAFTS IN THE LOWEST POSSIBLE ANGLE AND AT THE SAME TIME MOVES THE LARGEST PISTON POSSIBLE.

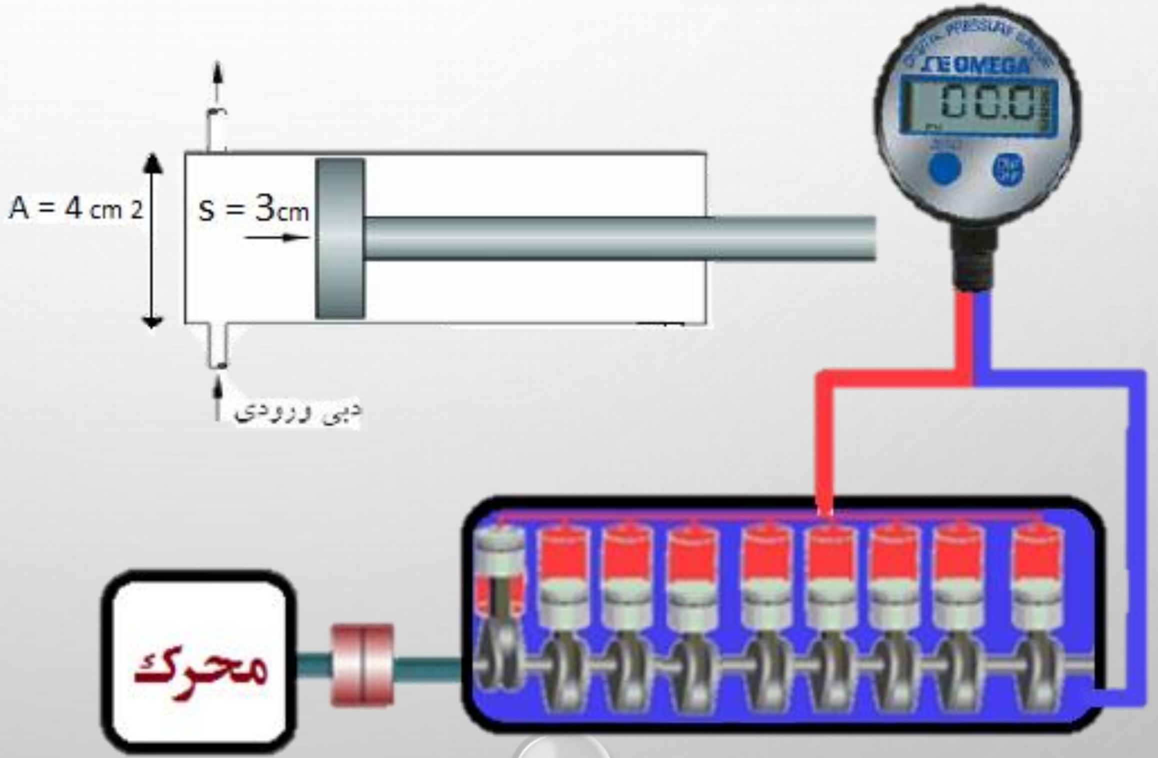
4. WE WILL HAVE MORE.

5. BECAUSE IT ONLY HAS ONE PISTON, IT CAN WITHSTAND MORE PRESSURE.



THE FOLLOWING IS A SCHEMATIC DIAGRAM OF THE NEW METHOD, THE DRIVE WITH A POWER OF 3KW AND 1500RPM, AND A CAMSHAFT, WHICH IS A NEW METHOD, DISPLACES 9 PISTONS WITH A CM 4 DIAMETER AND CM 3, AND THE CENTER OF THE CENTER TO THE CENTER OF THE CAM IS 40 °, SO THAT WHEN THE MOVEMENT OF THE FORCE APPLIED TO EACH PISTON IS SEPARATE AND THE MAXIMUM OUTPUT OF THE ACTUATOR IS INTRODUCED INTO A PISTON.





(PISTON DIAMETER) D=4 CM

A= $\frac{4\times4\times3.14}{4}$ = 12/56 CM2

(CAMSHAFT RADIUS) F = $\frac{T}{D} = \frac{120}{.04} = 3000n$ R=4CM

T = $f \times d \rightarrow$

(COURSE LENGTH)S = 3 CM

P= $\frac{f}{A} = \frac{3000}{12/5} = 238.8\,\frac{N}{CM^2}$

(NUMBER OF PISTONS) n_p = ٩

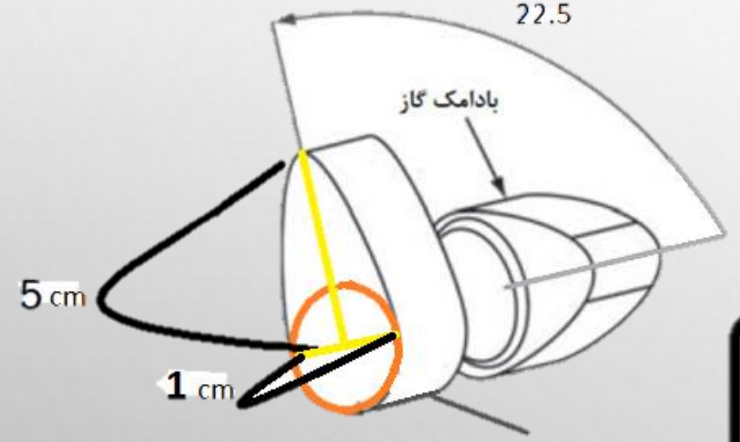
(ACTUATOR TORQUE)T =120 NM

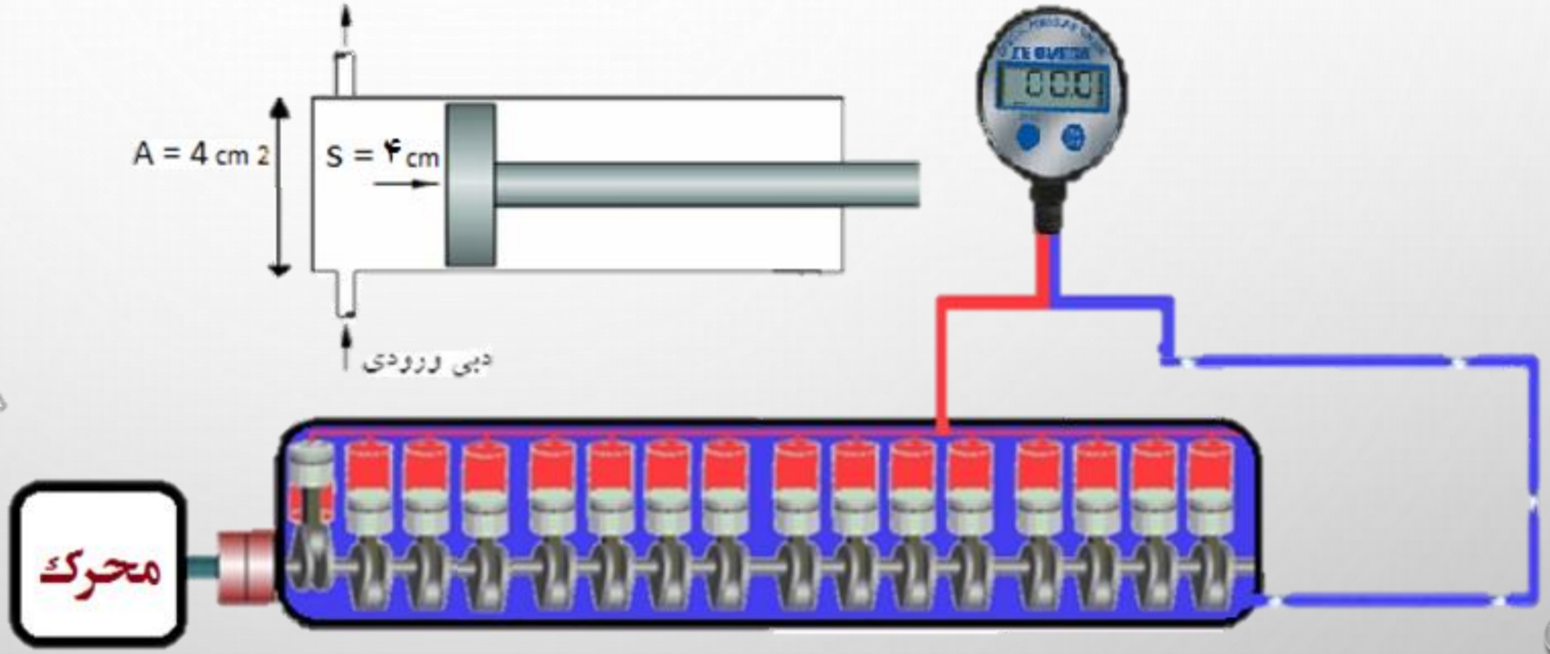
/REV $v_g = A \times L = 12.56 \times 3 \times 9 = 339CM^3$

/REV v_g 1= 84/ $\rightarrow$ ^{3} /REV v_g 2= $339CM^3$

P1=$191\,\frac{N}{CM^2}$ $\rightarrow$ P2= $238\,\frac{N}{CM^2}$

IN THE FIGURE BELOW, THE TORQUE OF THE ACTUATOR IS 120 NM AND ITS WORKING SPEED IS 1500 RPM. 16 PISTONS WITH A DIAMETER OF CM 4 AND CM 4, AND THE CENTER OF THE CENTER TO THE CENTER OF THE CAM IS 22.5 °, SO THAT WHEN THE FORCE IS APPLIED TO EACH PISTON SEPARATELY, THE MAXIMUM OUTPUT OF THE ACTUATOR IS INTRODUCED INTO ONE PISTON AT 22 °. .





(PISTON DIAMETER) D=4 CM

(CAMSHAFT RADIUS)R=5CM

(COURSE LENGTH)S = 4 CM

(NUMBER OF PISTONS) n_p = ۱۶

(ACTUATOR TORQUE)T =120 NM

v_g = $A \times L$= $12.56 \times 4 \times 16 = 803CM^3$ /REV

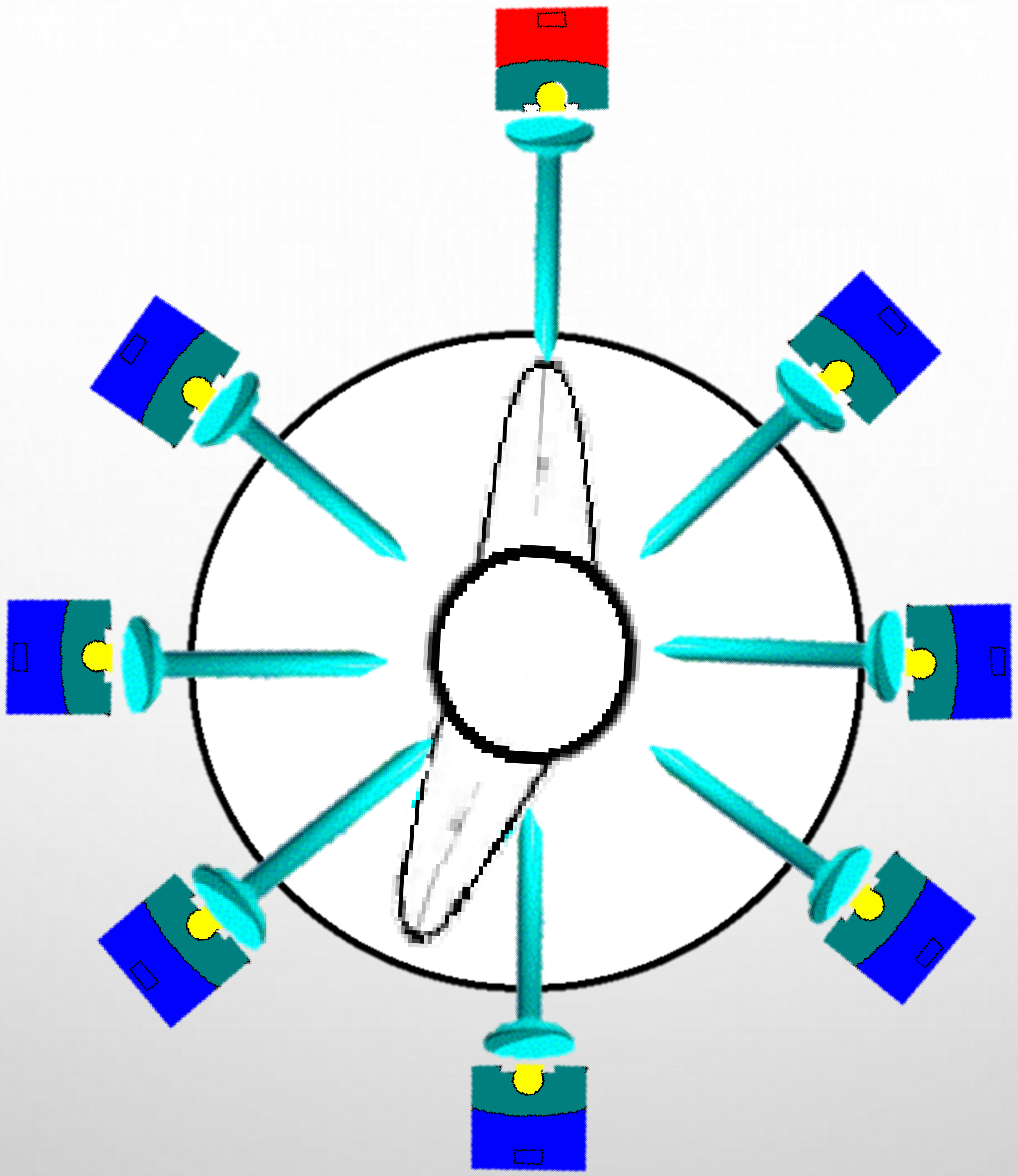
v_g 1= 84/78 cm^3 /REV $\Rightarrow$ v_g 2= $803CM^3$ /REV

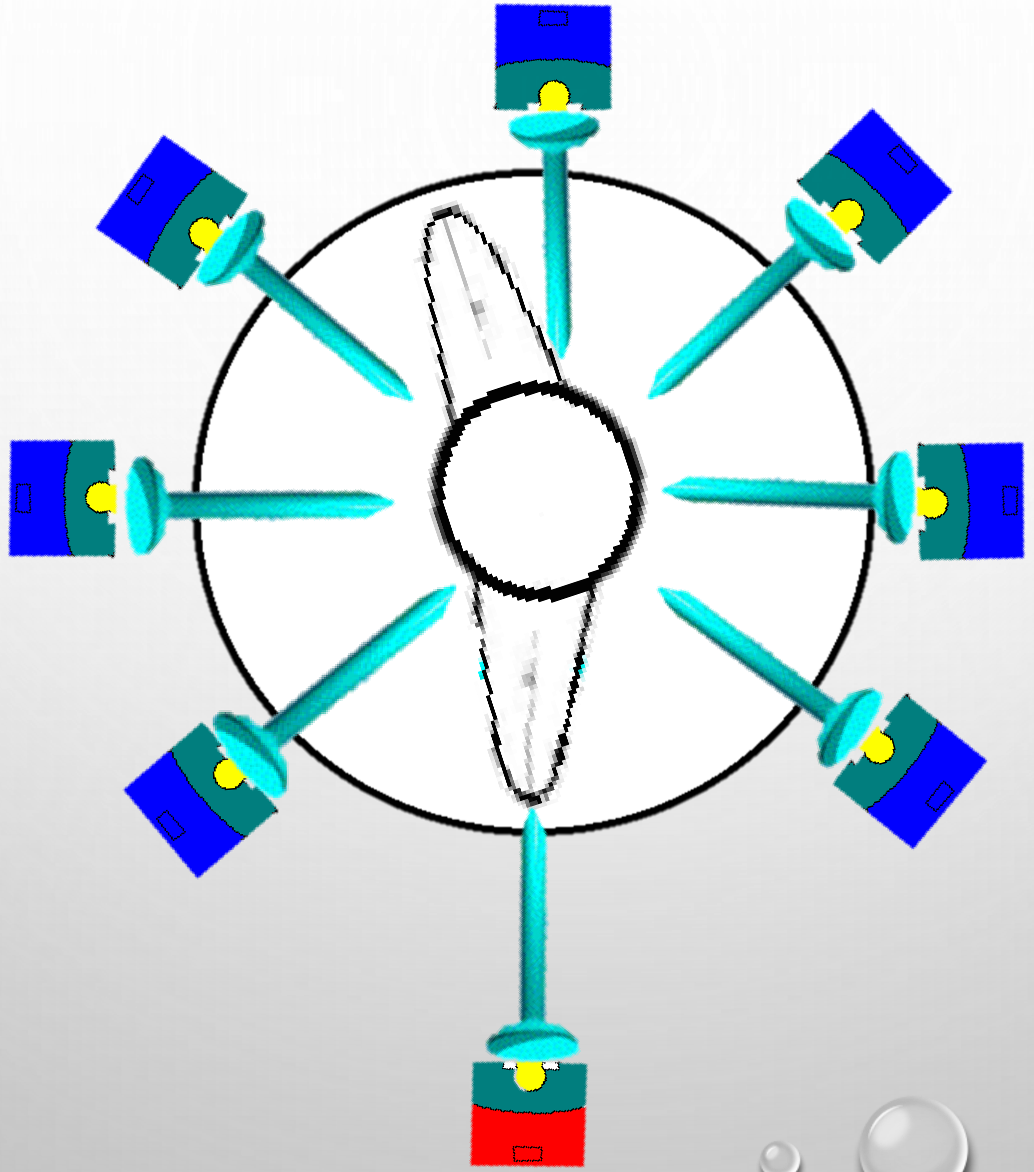
P1=$191\frac{N}{CM^2}$ $\Rightarrow$ P2= $191\frac{N}{CM^2}$

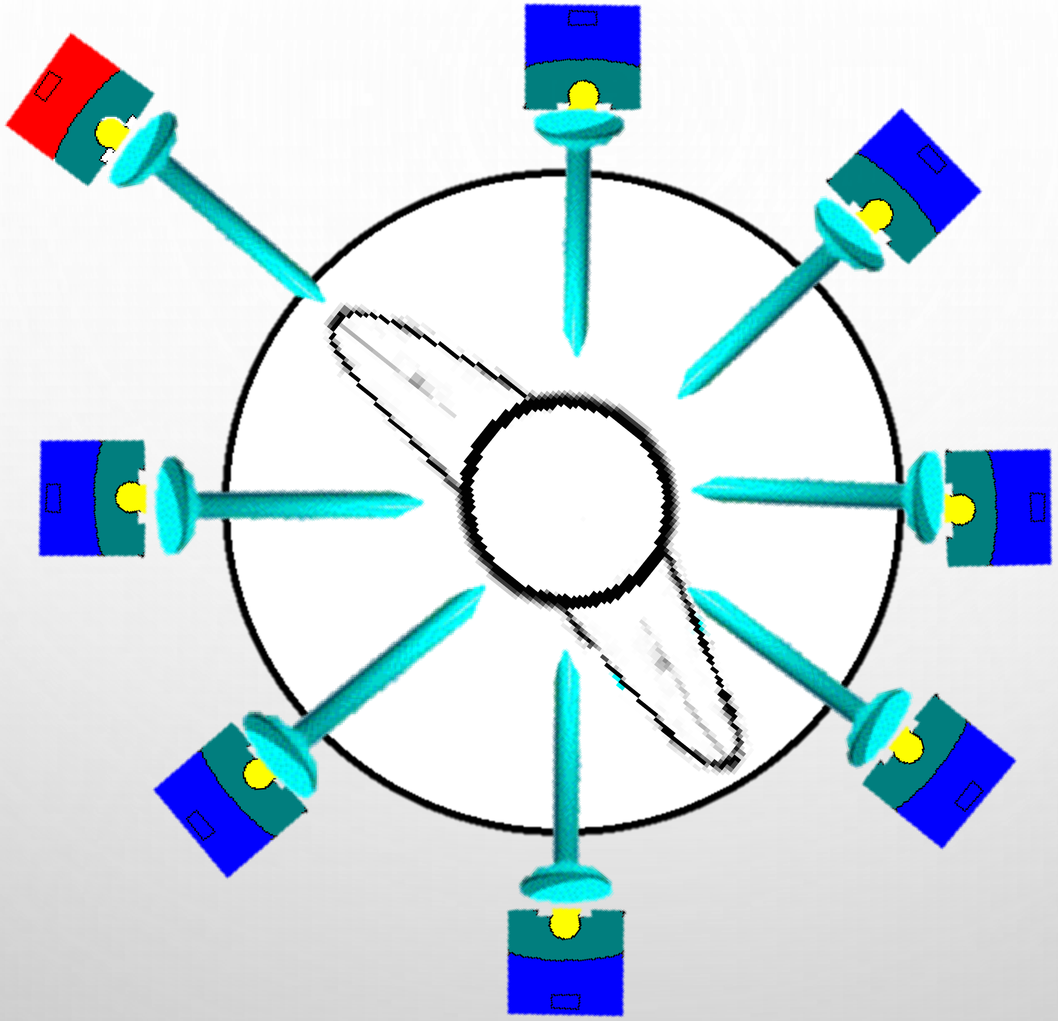
A= $\frac{4\times4\times3.14}{4}$ = 12/56 CM2

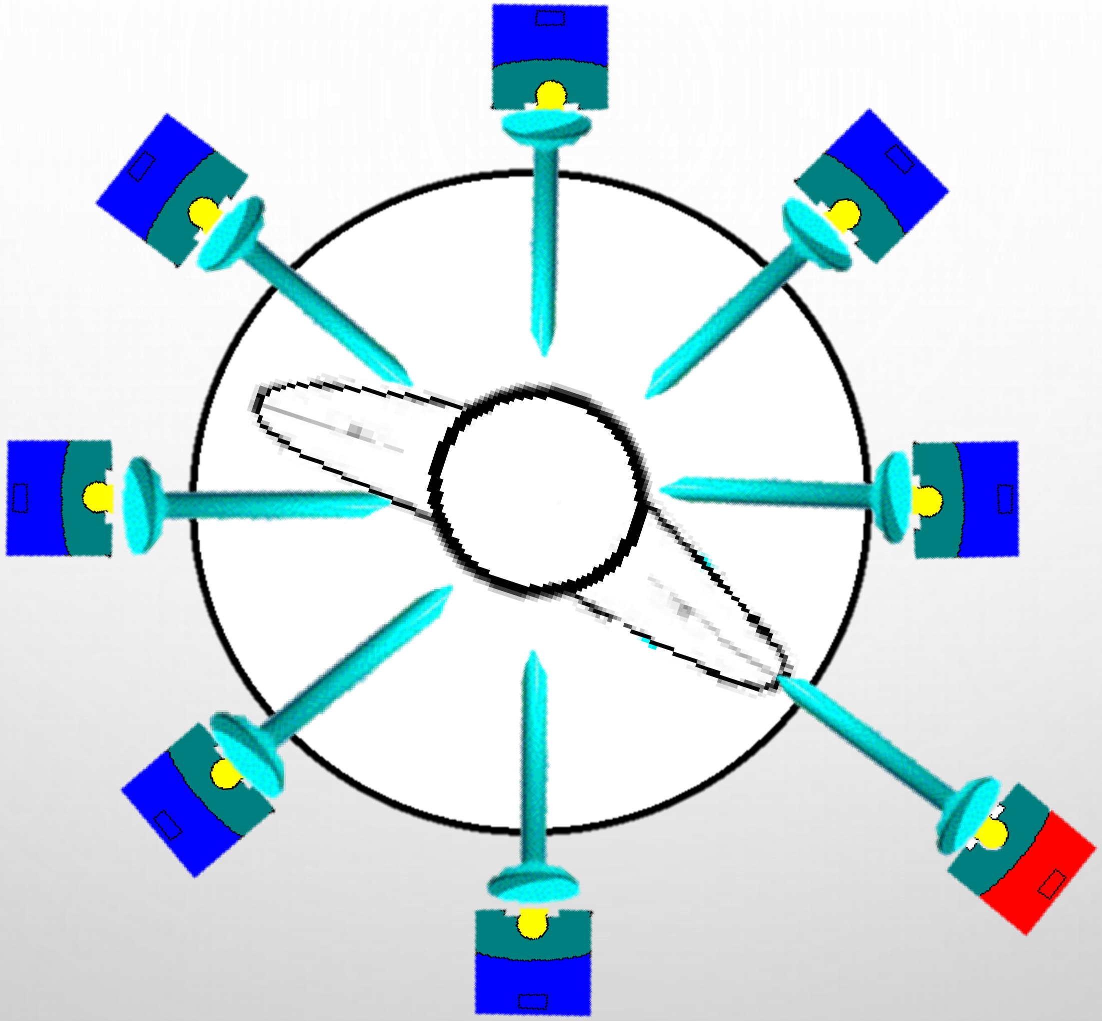
F = $\frac{T}{D} = \frac{120}{.05} = 2400$

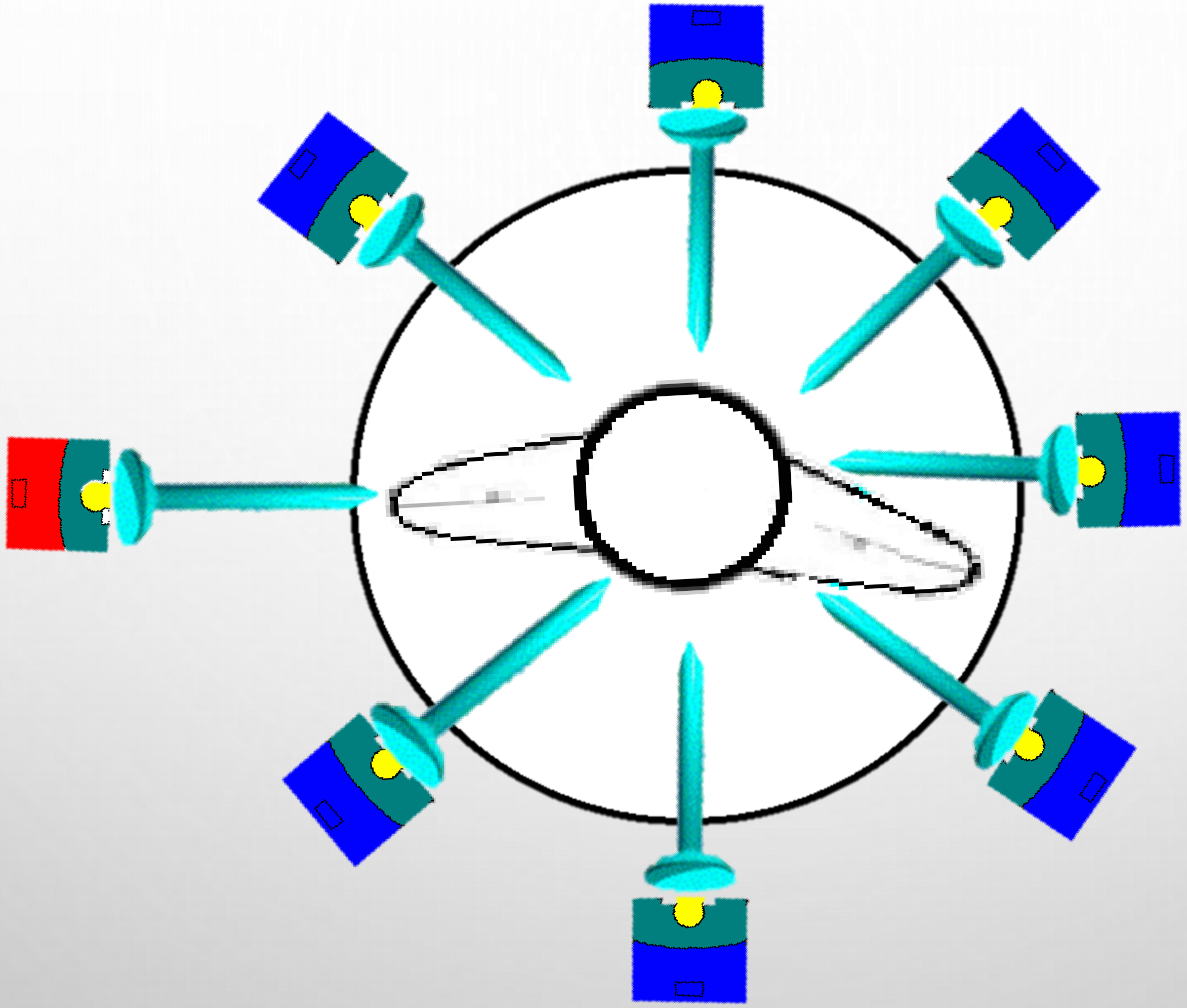
P= $\frac{N}{A} = \frac{2400}{12/5} = 191\frac{N}{CM^2}$

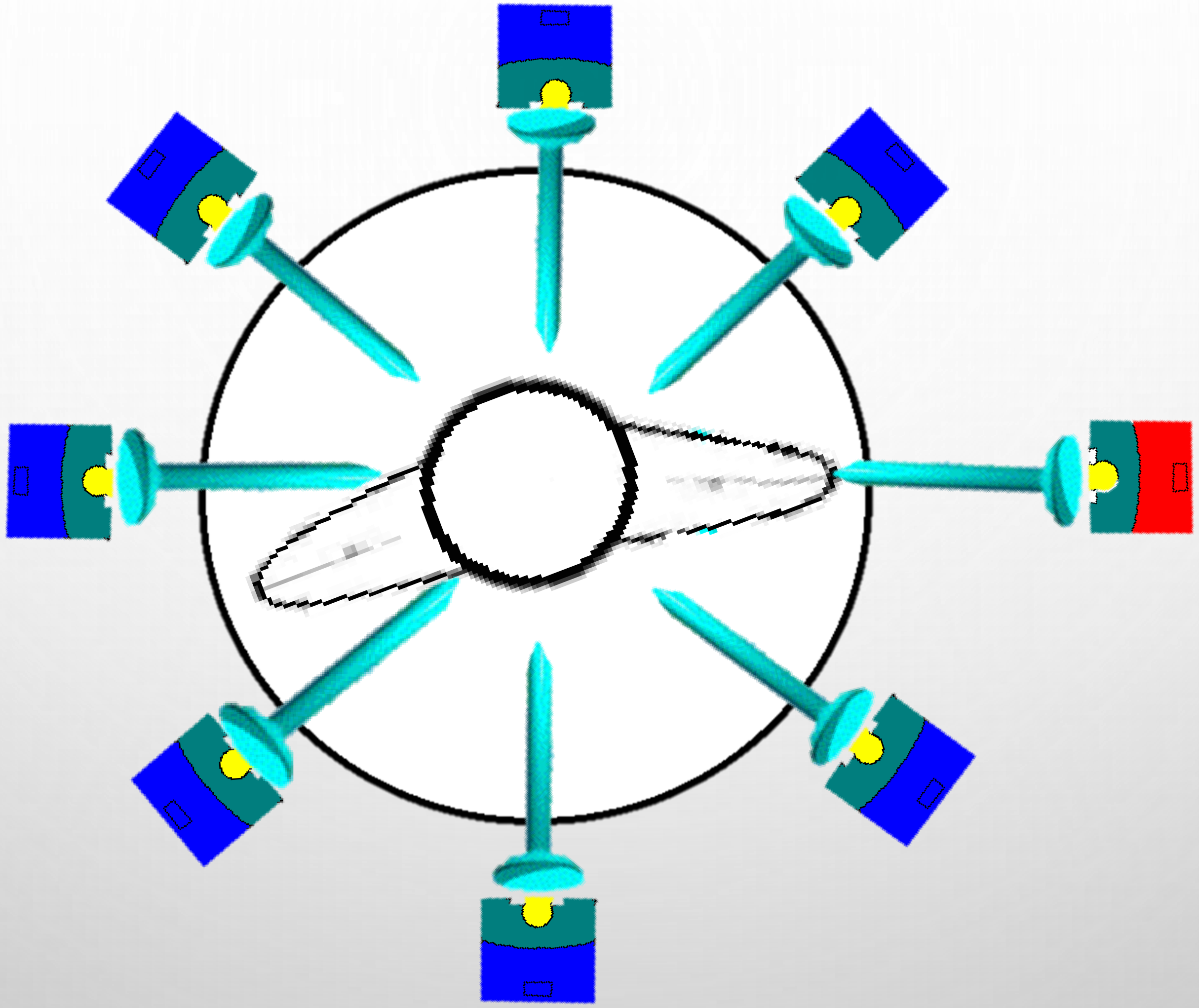


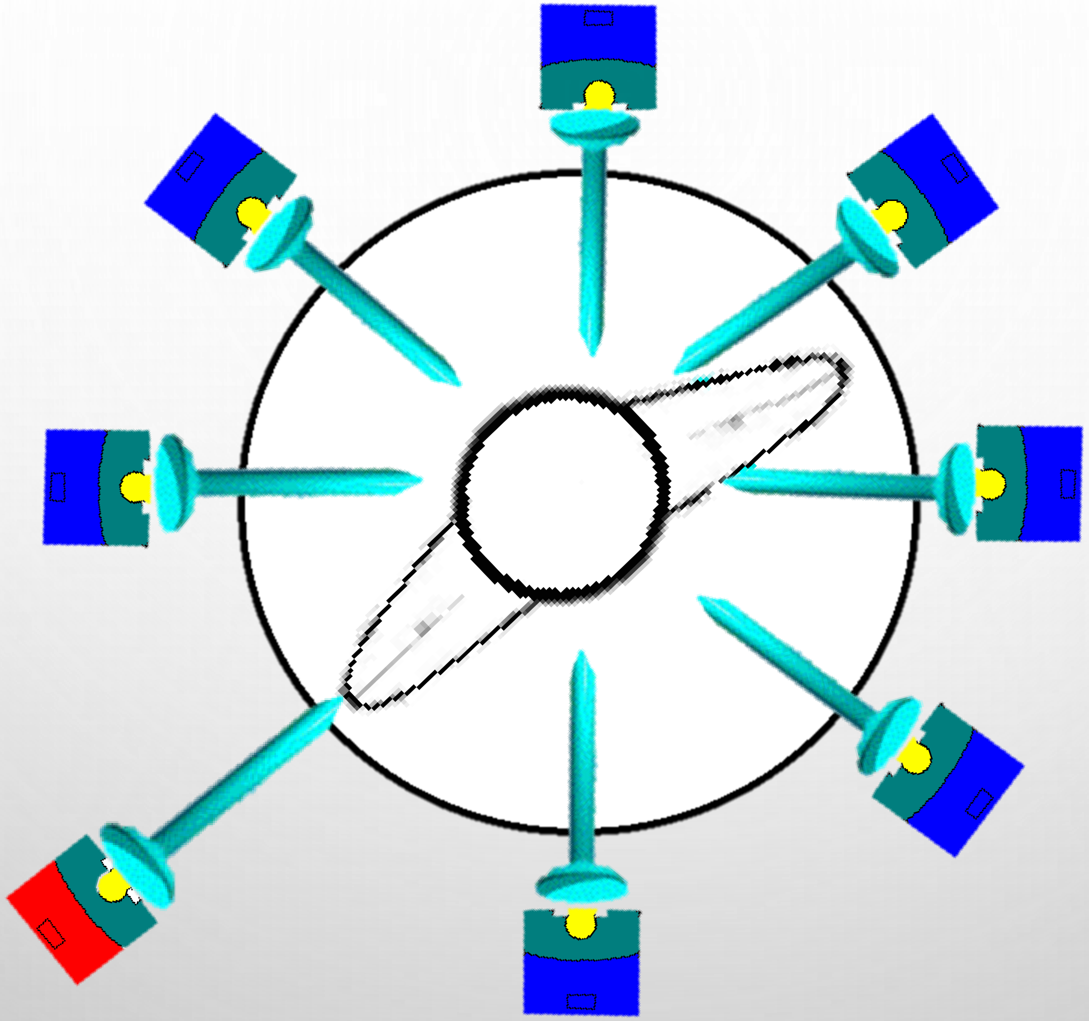


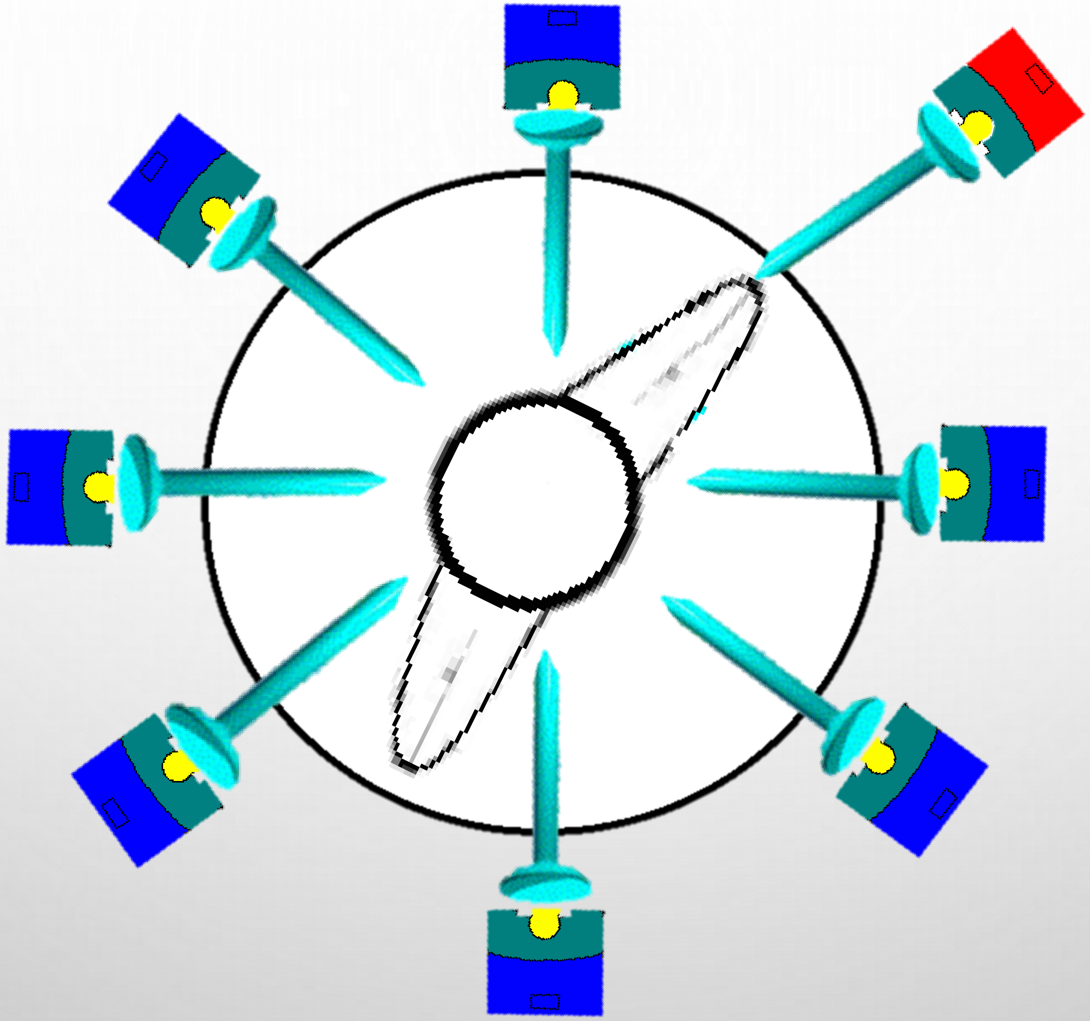


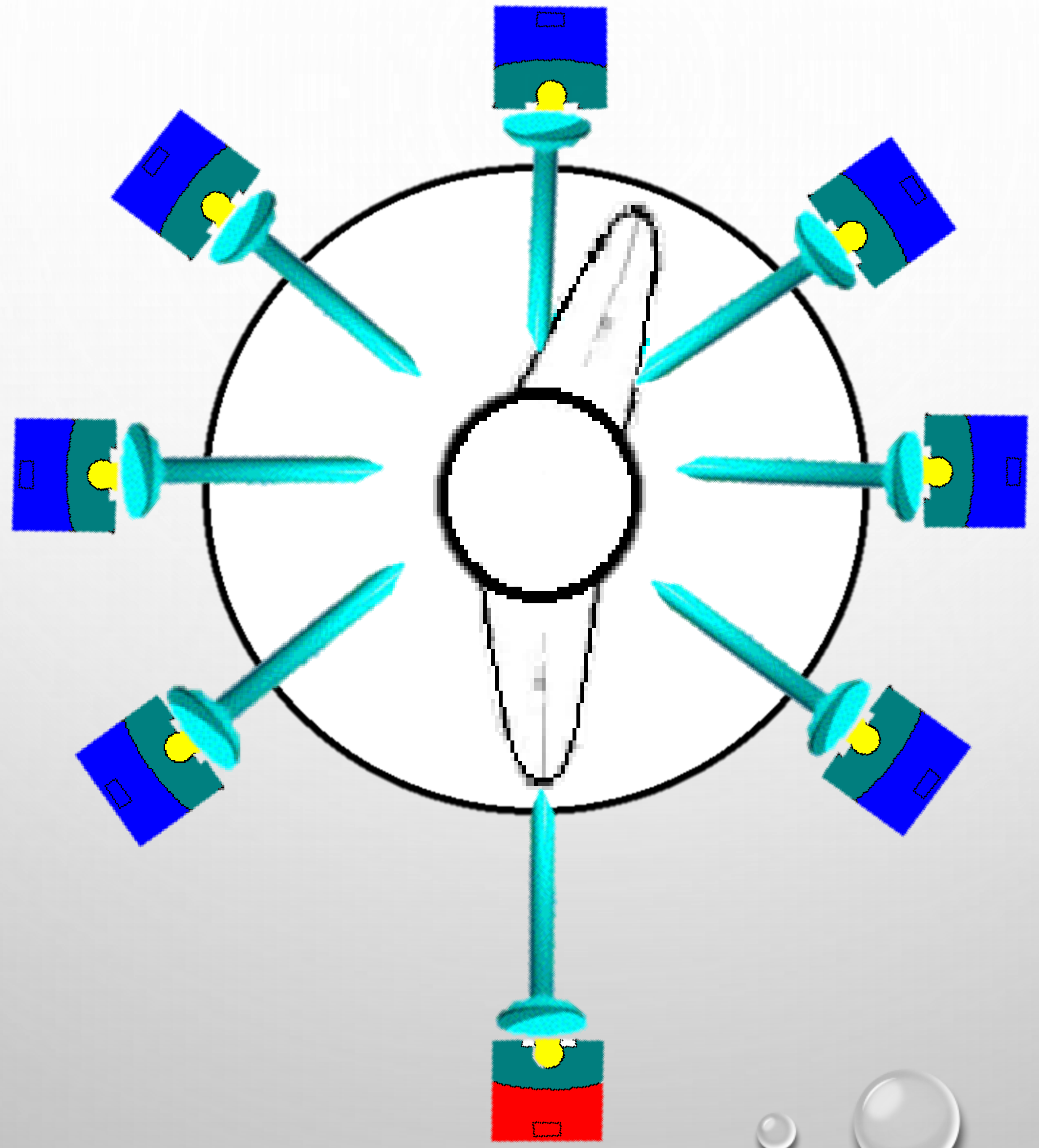


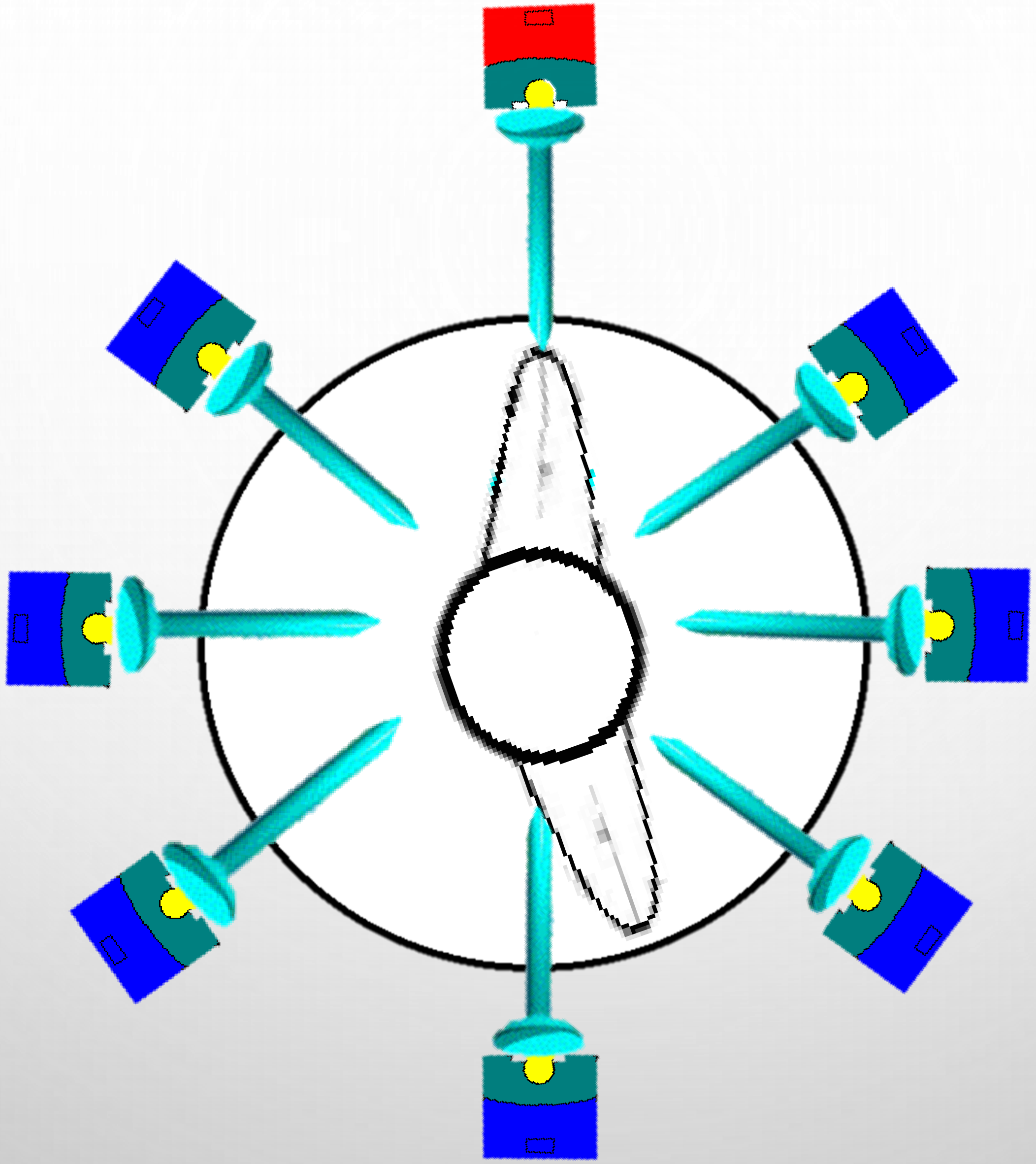


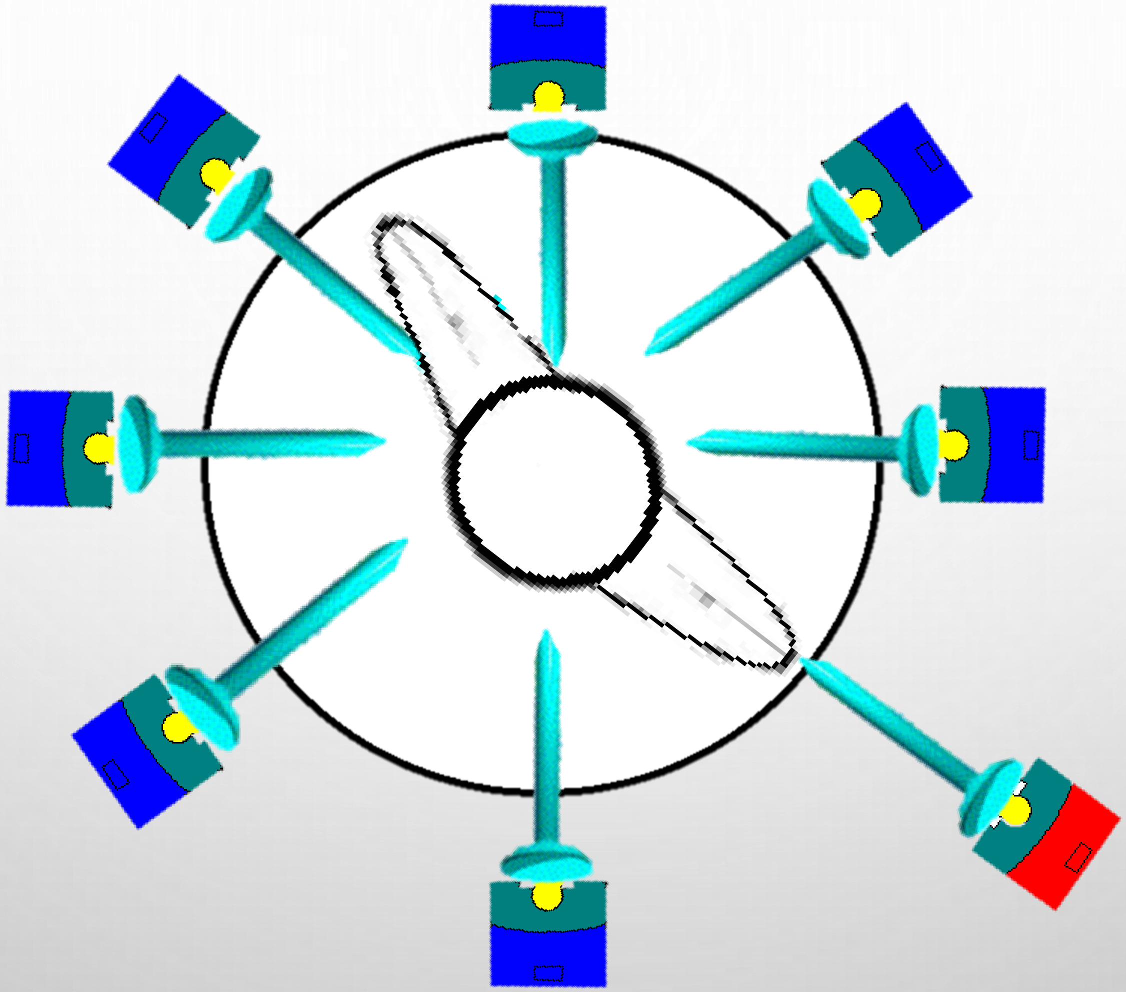


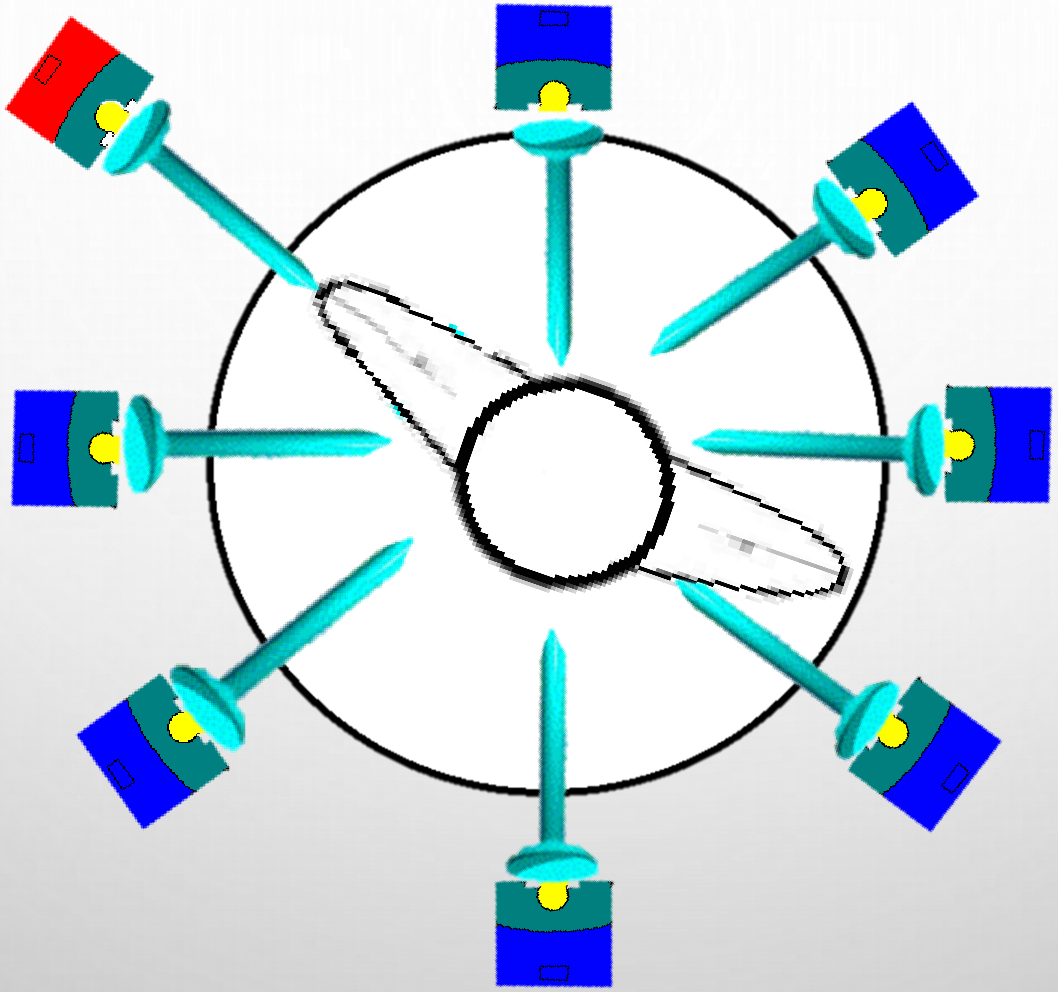


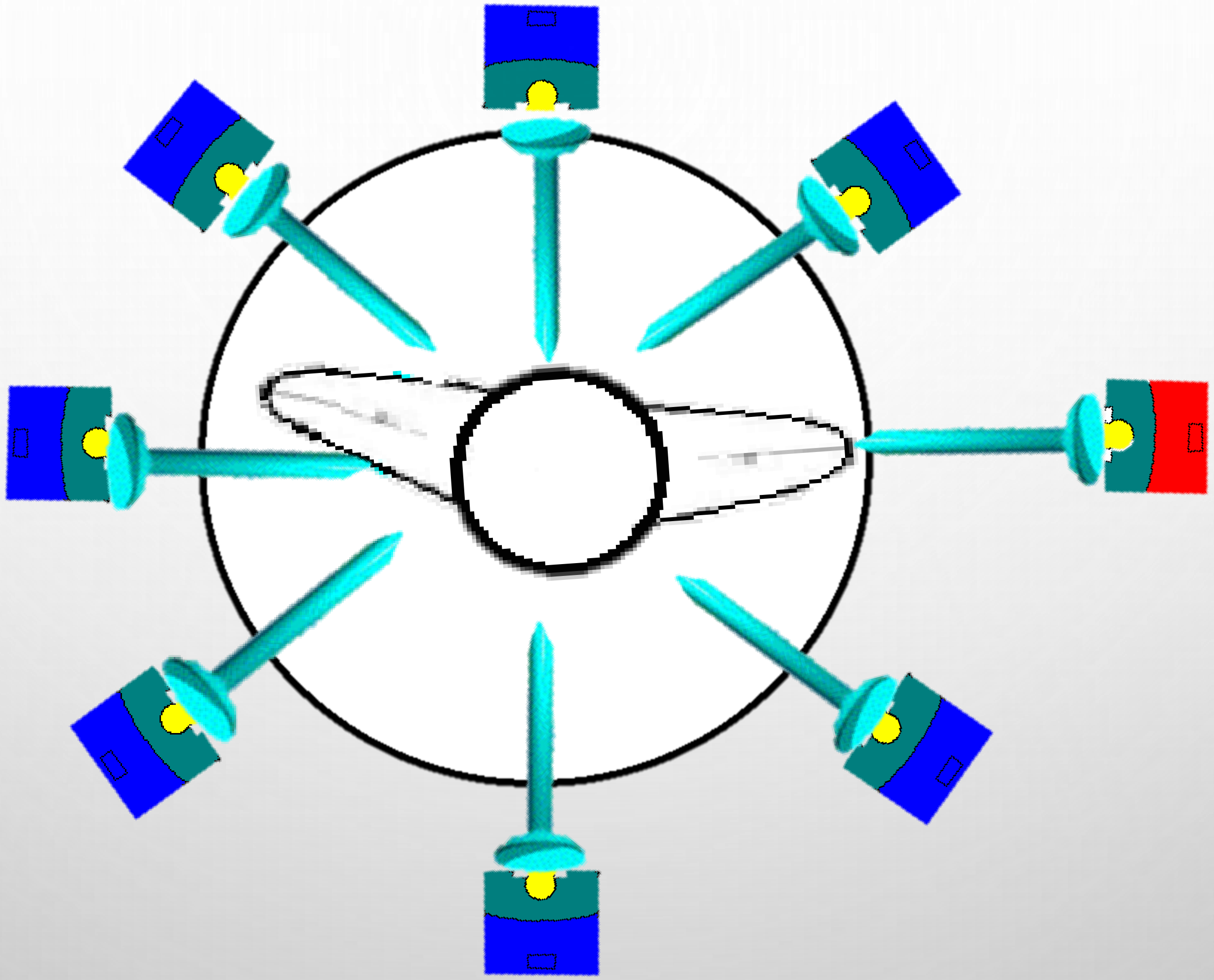


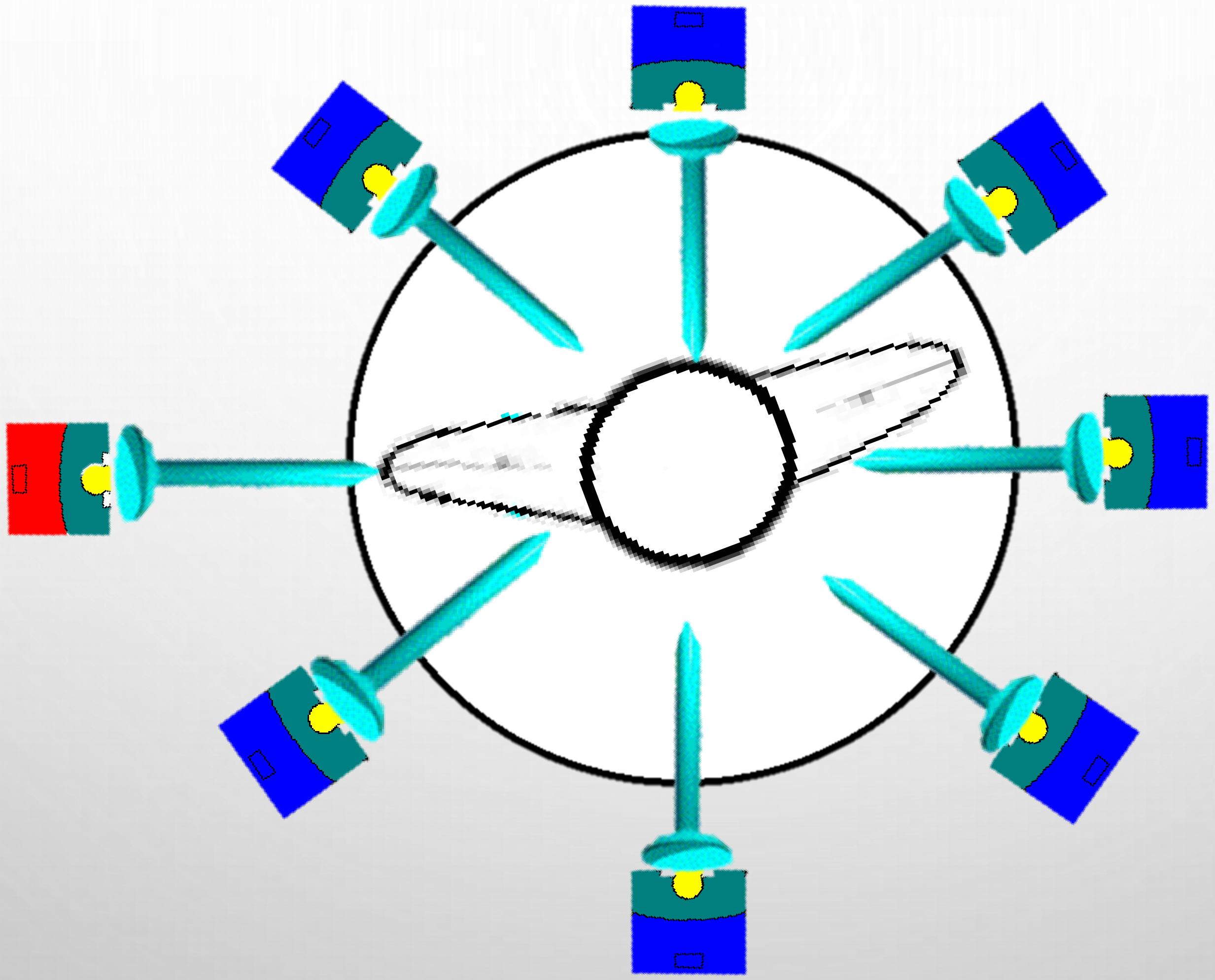


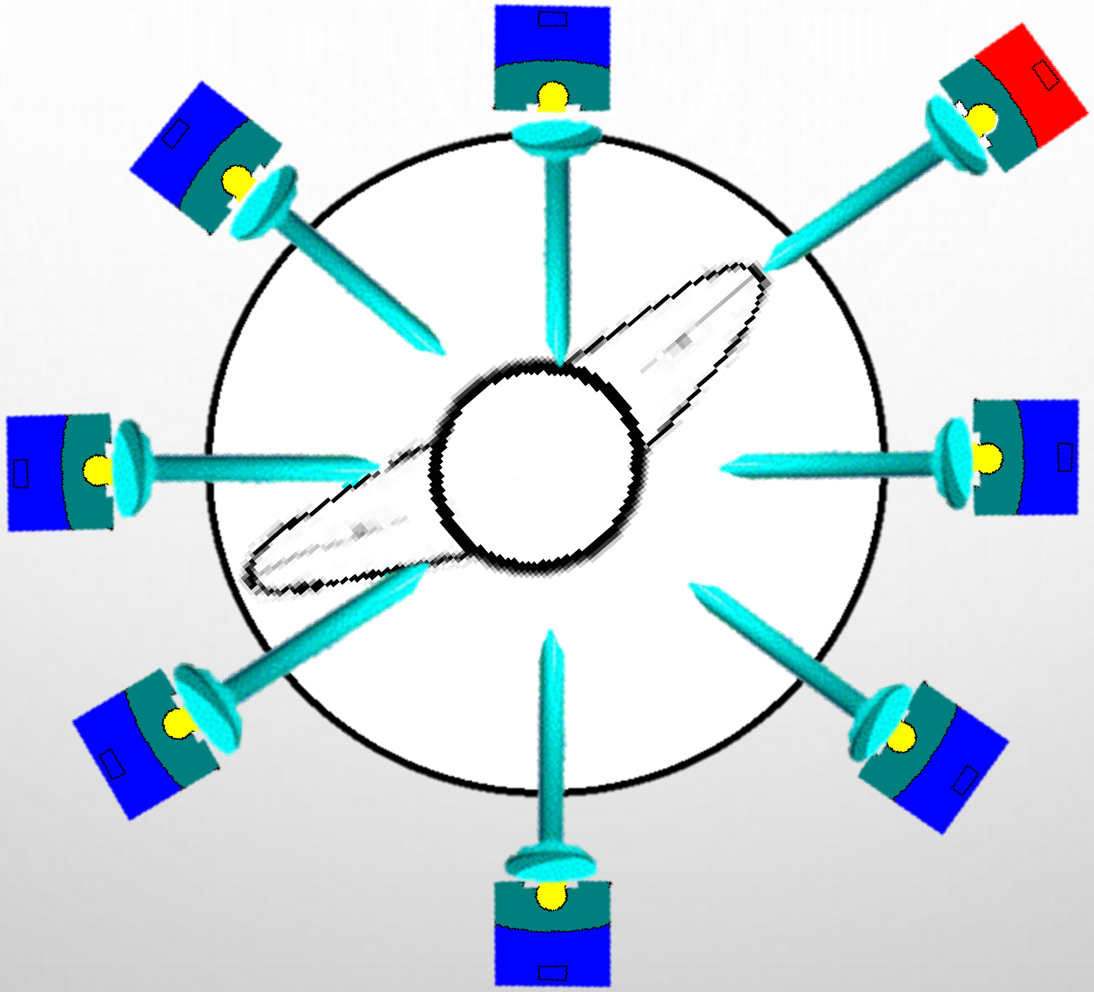


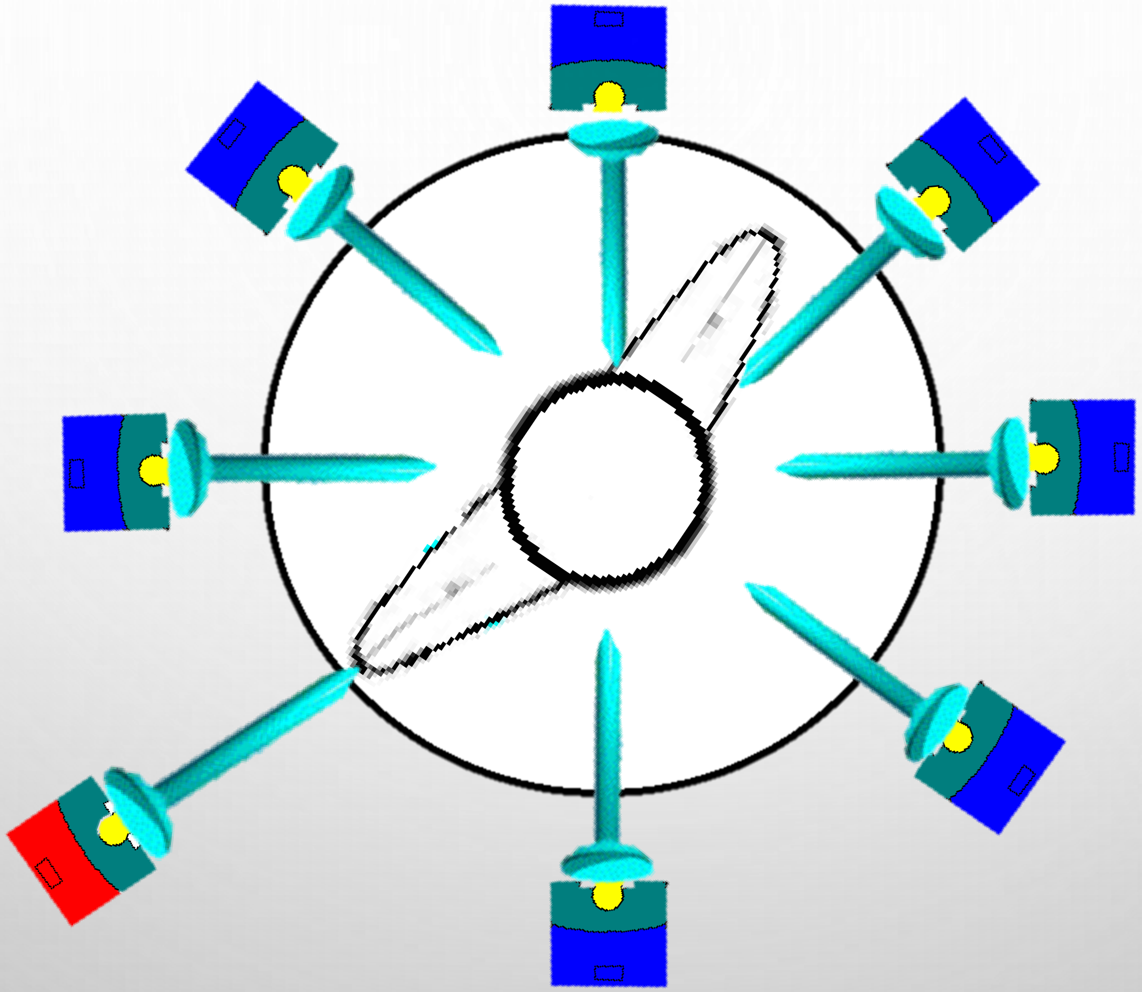


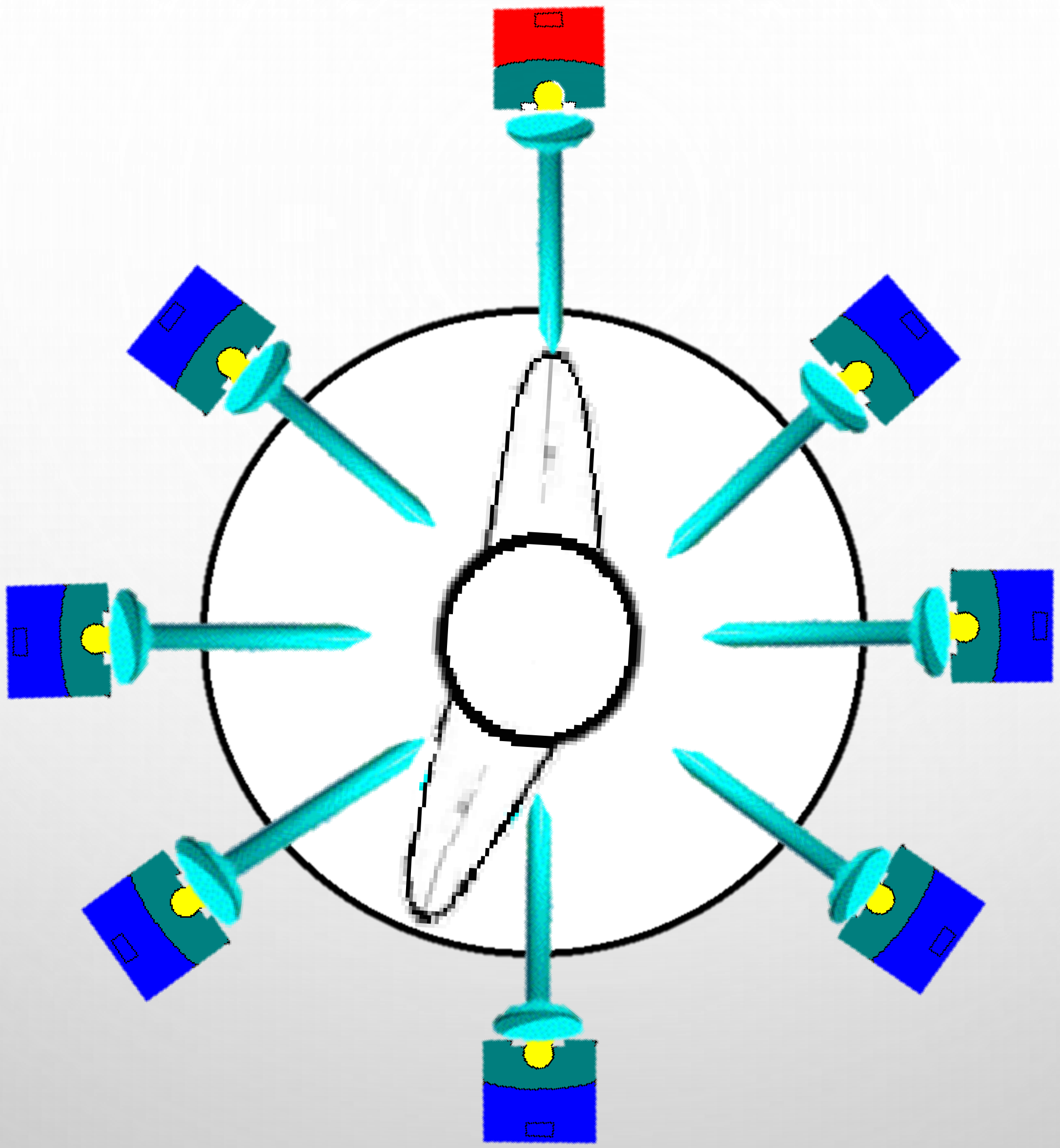


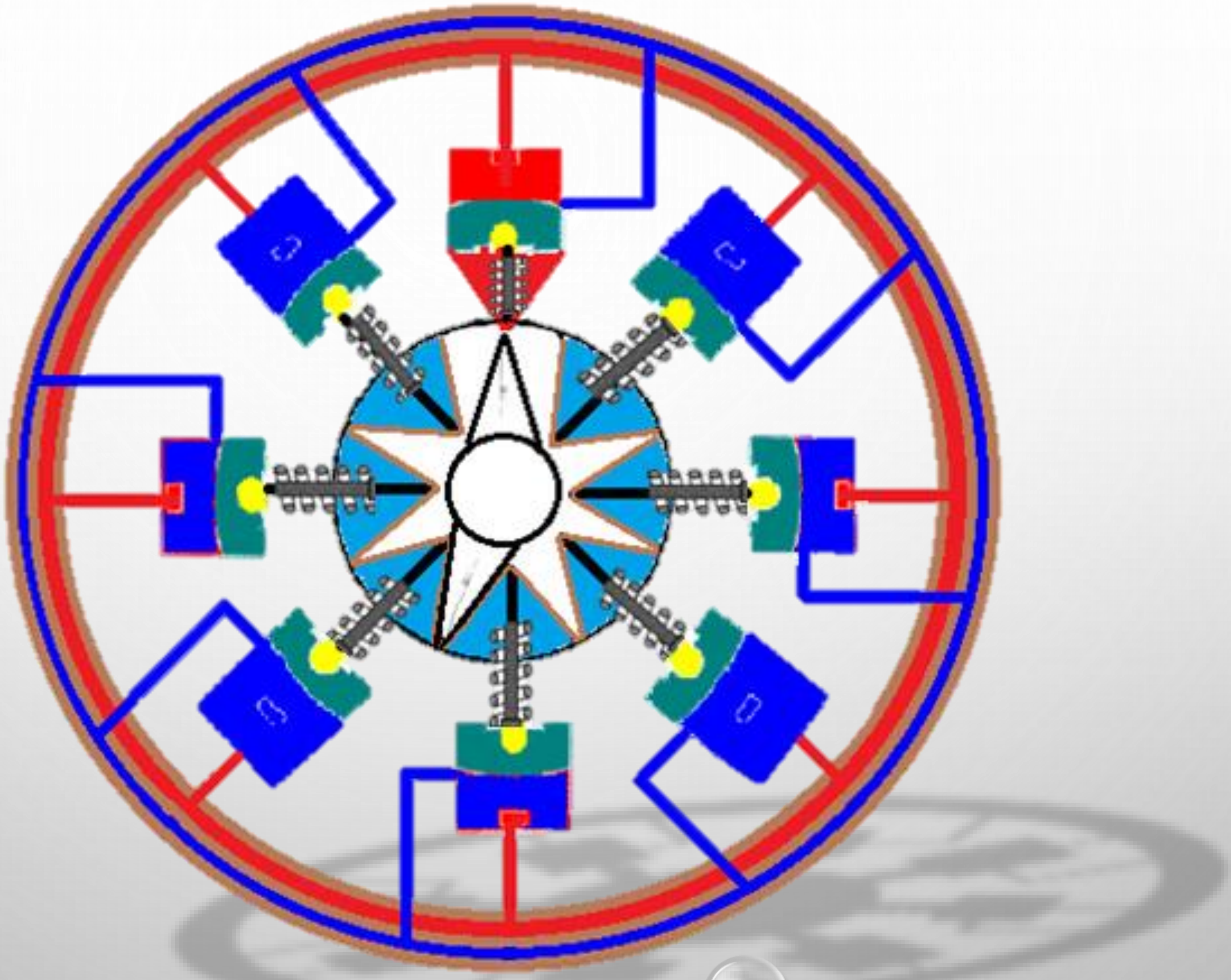












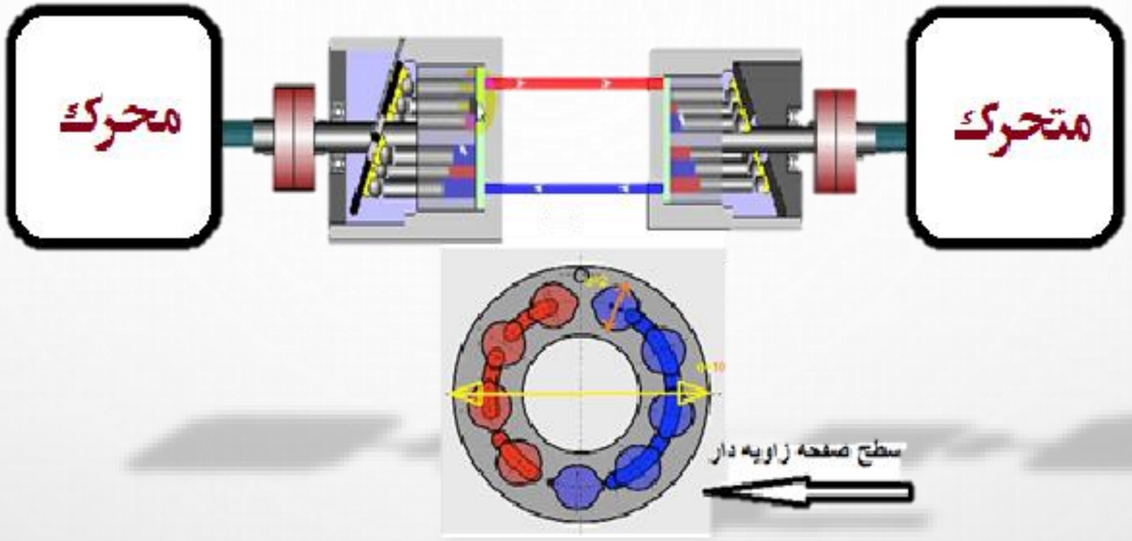
AN EXAMPLE OF A HYDRAULIC PUMP AND A HYDROMOTOR TABLE:

Size				5	10	12	16	23	28	32	45	56	63	80
Displacement		V_g	cm^3	4,93	10,3	12	16	22,9	28,1	32	45,6	56,1	63	80,4
Max. Speed		n_{max}	min^{-1}	10 000	8000	8000	8000	6300	6300	6300	5600	5000	5000	4500
		$n_{max\ intermit.}$ 1)	min^{-1}	11 000	8800	8800	8800	6900	6900	6900	6200	5500	5500	5000
Max. flow	n_{max}	$q_{V\ max}$	L/min	49	82	96	128	144	176	201	255	280	315	360
Torque constants		T_K	Nm/bar	0,076	0,164	0,19	0,25	0,36	0,445	0,509	0,725	0,89	1,0	1,27
Torque at	$\Delta p = 350$ bar	T	Nm	24,7 2)	57	67	88	126	156	178	254	312	350	445
	$\Delta p = 400$ bar	T	Nm	–	65	76	100	144	178	204	290	356	400	508
Case volume			L		0,17	0,17	0,17	0,20	0,20	0,20	0,33	0,45	0,45	0,55
Moment of inertia about drive axis		J	kgm^2	0,00008	0,0004	0,0004	0,0004	0,0012	0,0012	0,0012	0,0024	0,0042	0,0042	0,0072
Weight (approx.)		m	kg	2,5	5,4	5,4	5,4	9,5	9,5	9,5	13,5	18	18	23

Size				5	10	12	16	23	28	32	45	56	63	80
Displacement		V_g	in^3	0.30	0.63	0.73	0.98	1.40	1.71	1.95	2.78	3.42	3.84	4.91
			cm^3	4.93	10.3	12	16	22.9	28.1	32	45.6	56.1	63	80.4
Max. speed		n_{max}[1]	rpm	5600	3150	3150	3150	2500	2500	2500	2240	2000	2000	1800
		$n_{max\ limit}$[2]	rpm	8000	6000	6000	6000	4750	4750	4750	4250	3750	3750	3350
Max. flow at n_{max}		$q_{V\ max}$	gpm	7.3	8.6	10.0	13.2	15.1	18.5	21.1	27.0	29.6	33.3	38.0
			L/min	27.6	32.4	37.8	50	57	70	80	102	112	126	144
Power at	$\Delta p = 5100$ psi	P_{max}	HP	19.5[3]	25	30	39	44	55	63	80	88	99	113
	$\Delta p = 350$ bar	P_{max}	kW	14.5[3]	18.9	22	29.2		41	47	59.5	65	73.5	84
	$\Delta p = 5800$ psi	P_{max}	HP	–	30	34	45	51	63	71	91	100	113	129
	$\Delta p = 400$ bar	P_{max}	kW	–	22	25	34	38	47	53	68	75	84	96
Torque at	$\Delta p = 5100$ psi	T	lb-ft	18[3]	42	50	65	94	116	132	189	232	260	331
	$\Delta p = 350$ bar	T	Nm	24.7[3]	57	67	88	126	156	178	254	312	350	445
	$\Delta p = 5800$ psi	T	lb-ft	–	48	56	75	107	131	150	214	263	295	377
	$\Delta p = 400$ bar	T	Nm	–	65	76	101	145	178	203	290	356	400	511
Rotary stiffness		c	Nm/rad	625	922	1250	1590	2560	2930	3120	4180	5940	6250	8730
Moment of inertia for rotary group		J_{TW}	$lbs\text{-}ft^2$	0.0014	0.0095	0.0095	0.0095	0.0285	0.0285	0.0285	0.0569	0.0997	0.0997	0.1708
			kgm^2	0.00006	0.0004	0.0004	0.0004	0.0012	0.0012	0.0012	0.0024	0.0042	0.0042	0.0072
Angular acceleration max.		α	rad/s^2	5000	5000	5000	5000	6500	6500	6500	14600	7500	7500	6000
Filling capacity		V	gal		0.045	0.045	0.045	0.053	0.053	0.053	0.087	0.119	0.119	0.145
			L		0.17	0.17	0.17	0.20	0.20	0.20	0.33	0.45	0.45	0.55
Mass (approx.)		m	lbs	5.5	12	12	12	21	21	21	30	40	40	51
			kg	2.5	5.4	5.4	5.4	9.5	9.5	9.5	13.5	18	18	23

FOR EXAMPLE, THIS CAN BE ANALYZED MECHANICALLY AND USING BASIC FORMULAS.

FOR EXAMPLE, THE:



IN THE FIGURE ABOVE, THERE IS AN ACTUATOR AND A MOVABLE WITH A POWER OF KW3 AND 1500RPM, AND A HYDRAULIC PUMP AND A HYDROMOTOR, ALL OF WHICH ARE EQUAL, THE VALUES OF WHICH ARE AS FOLLOWS.

T = 1500/60 = 25 RPM $p = T \,/\, t \rightarrow T = p \times t$ = 3000 × .04 = 120NM

ANGLED SCREEN) D = 10 CM
(DIAMETER

(PISTON DIAMETER) D = 2 CM

(COURSE LENGTH) S =3CM

(NUMBER OF PISTONS) n_p =9

(ACTUATOR TORQUE)T =120 NM

$$P = \frac{f \times d}{t} \rightarrow F = \frac{p \times t}{d} = \frac{3000 \times .04}{.05} = 2400n$$

$$P = \frac{f}{a} = \frac{2400}{1 \times 1 \times 3/14 \times 4} = 191 \text{ N}/cm^2$$

$$v_g = A \times L = \frac{2 \times 2 \times 3.14}{4} \times 3 \times 9 =$$

$$v_g = 84.78\ cm^3 \text{ /REV}$$

NOW, IF WE GIVE THE SAME VALUES TO THE SAME HYDROMOTOR: P $= T / t$

$$v_g = A \times L = \frac{2 \times 2 \times 3.14}{4} \times 3 \times 9 = 84.78\ cm^3 \text{ /REV}$$

$$P = \frac{f \times d}{t} \rightarrow F = \frac{p \times t}{d} = \frac{3000 \times .04}{.05} = 2400n$$

$$P = \frac{f}{a} = \frac{2400}{1 \times 1 \times 3/14 \times 4} = 191 \text{ N}/cm^2$$

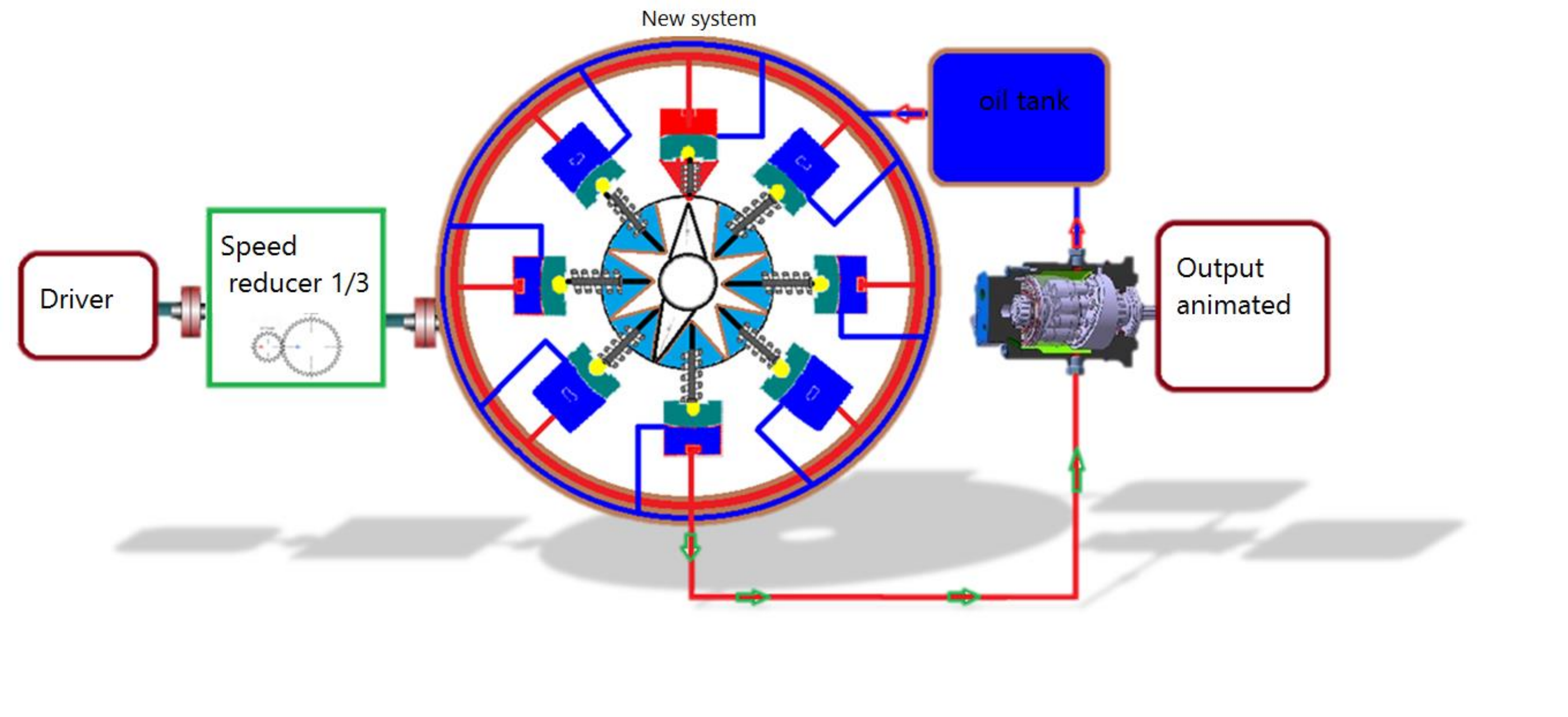
GOAL IDEAS:

INCREASED FLOW AND PRESSURE

INCREASE TORQUE AND SPEED

REDUCE CONSUMPTION

DUE TO ITS HIGH FLEXIBILITY IN THE SET OF ACCESS TO EVERYTHING, THE GOAL IS USUALLY TO INCREASE TORQUE AND SPEED, WHICH IN TURN WILL REDUCE CONSUMPTION.


New system
oil tank
Driver
Speed
reducer 1/3
Output
animated

(PISTON PUMP AREA) A=12.56 CM^2 $\quad$ $T = F \times d \rightarrow f = \frac{T}{d} = \frac{120\times3}{.05} = 7200n$

(UNDERPRESSURE AREA OF THE ENGINE) A=12.56CM $\quad$ $P = \frac{N}{A} = \frac{7200}{12.56} = 573.24 \frac{N}{CM^2}$

(NUMBER OF PISTON PUMPS) $n_p = 16$ $\quad$ $v_g = 12.56 \times 4 \times 16 = 803.84 CM^3$ /REV

(ENGINE PISTON NUMBER) n_p = ٩ $\quad$ $n = \frac{1500}{3} = 500rpm$ $\quad$ Q= $v_g \times N = 803 \times 500 = 401.9 \frac{litr}{min}$

(ACTUATOR TORQUE) T =120 NM $\quad$ $p = \frac{573}{191} = 3$ $\quad$ *and* $\quad$ $v_g = \frac{803/84}{84.78} = 9/481$

(PUMP COURSE) l_p = 4CM $\quad$ N =500 × 9/481 = 4741 RPM $\quad$ $Q = \frac{401/9}{127} = 3.16$

(ENGINE COURSE) l_p = 3CM $\quad$ $P = \frac{f}{A} \rightarrow F = P \times A = 573 \times 12.56 = 7200n$

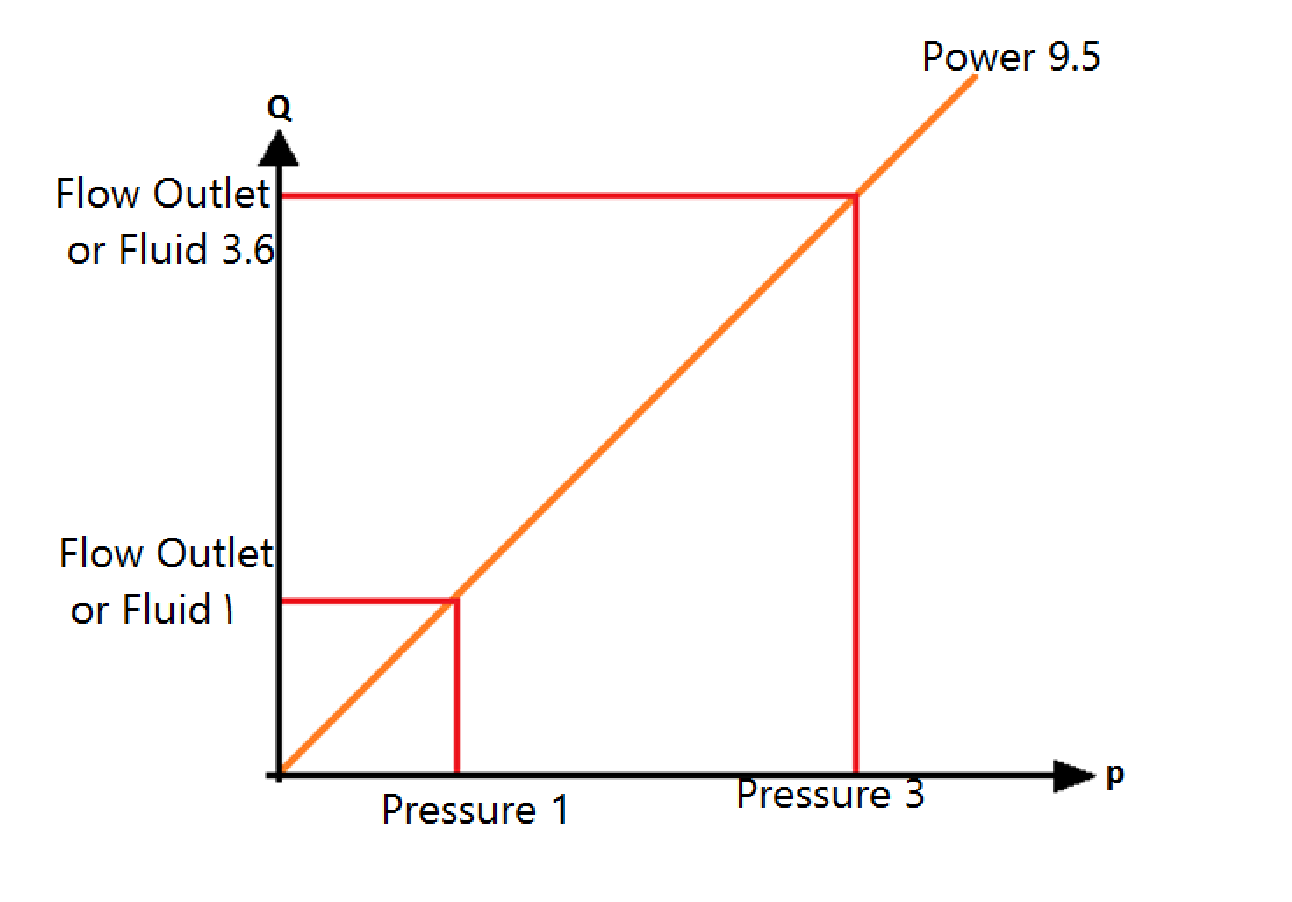
(QATAR PUMP SHAFT) D=2 CM $\quad$ $T = F \times d = 7200 \times .05 = 360$ NM

(ENGINE VOLUME) v_g =87.78CC $\quad$ T = 120NM → T = 360NM $\quad$ AND $\quad$ n = 1500RPM → n = 4741RPM

(DRIVING SPEED) N=1500RPM $\quad$ $P = T\times\omega = 120 \times \frac{1500}{60} = 3$ KW $\rightarrow$ $P = T\times\omega = 360 \times \frac{4741}{60} = 28.5$ KW

THE FLOW AND PRESSURE DIAGRAMS ARE EXPONENTIALLY INCREASING, WHICH WILL RESULT IN INCREASED POWER.

$$P = Q \times p$$



- IN THE DEFINED SET, IT WAS FIRST ESTABLISHED THAT BY PLACING THE SAME HYDRAULIC PUMP AND THE SAME HYDRAULIC MOTOR, THE INPUT AND OUTPUT POWERS ARE THE SAME. BUT BY INCREASING THE TORQUE AT THE HYDRAULIC PUMP INPUT AND WITH THE SAME PRE-PRESSURIZED CROSS SECTION, THE VOLUME OF DISPLACEMENT AND PUMP OUTLET PRESSURE IT IS EQUALLY INCREASED, WHICH MAKES THE SYSTEM ABLE TO WITHSTAND HIGHER OUTPUT IN THE HYDROMOTOR. OF COURSE, IT SHOULD BE NOTED THAT AT THE OUTSET THE OUTPUT POWER IS THE SAME WITH THE INPUT, BUT NOW WITH CHANGES IN THE HYDRAULIC PUMP, THE LOAD BEARING CAPACITY (SPEED AND TORQUE). IN THIS EXAMPLE, USING A SPEED REDUCER OF 3 TO 1, TORQUE IS 3 TIMES GREATER AND SPEEDS UP TO 1/3 TO REDUCE THE VELOCITY OF THE PUMP IN THE PUMP AND THUS THE FLOW AND FLOW TURBULENCE.
- WITH THIS SET YOU CAN REDUCE THE AMOUNT OF POWER INPUT OR INCREASE OUTPUT POWER.

CONCLUSION

SO FAR, THERE HAVE BEEN SOME "NON-FUEL ENGINES" INSIDE AND OUTSIDE THE COUNTRY THAT HAVE WORLD-CLASS AND INTERNATIONAL SCIENCE CREDITS, AND GIVEN THAT THE GOAL IN THIS IDEA IS TO ONLY IMPROVE THE EFFICIENCY OF THE SYSTEM IN A ROTATING POWER SYSTEM AND IT'S FIXED, BUT IT MOVES IN THE SAME DIRECTION. THIS IDEA IS THE ONLY PROTOTYPE OF THIS COLLECTION. I HOPE TO HELP ME IN THIS DIRECTION.

THANK YOU.

MOHAMMAD AMIN NIKOOKAR