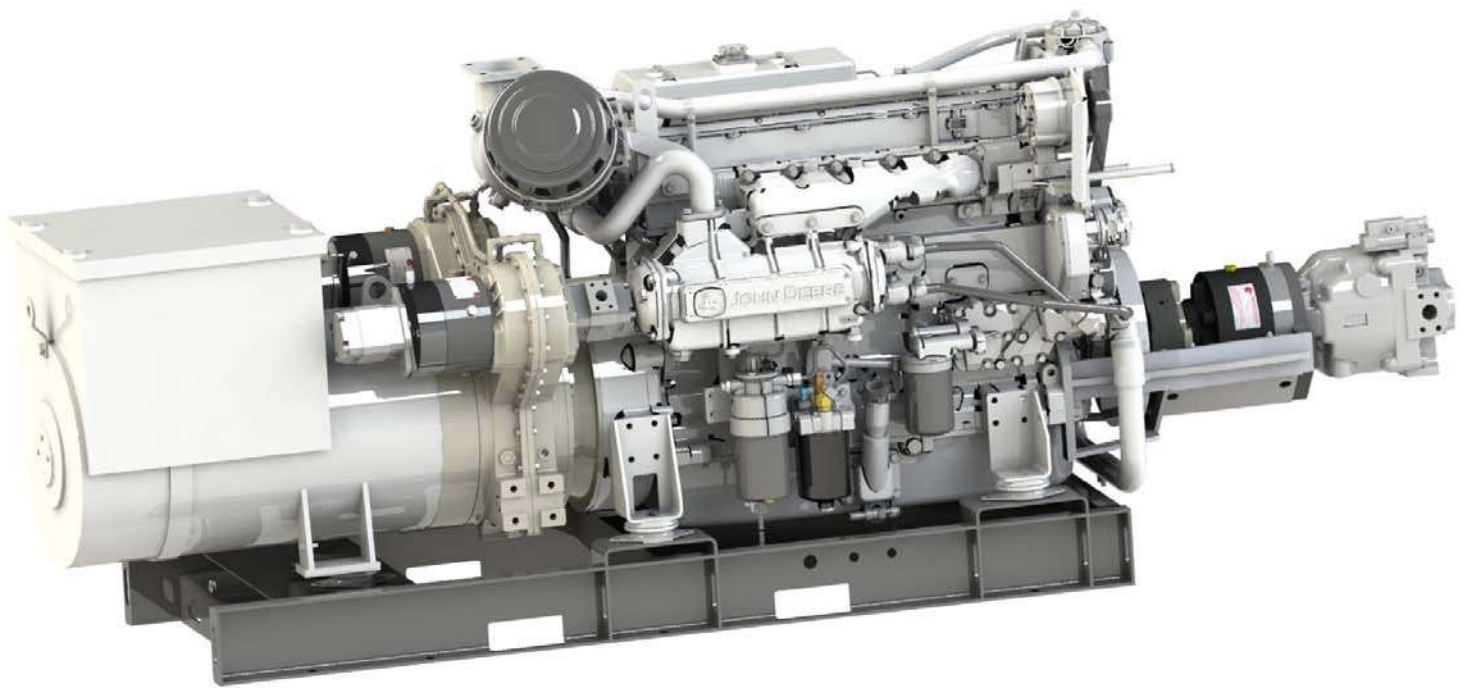


SPF Series Front of Engine Power Take-off (PTO) Clutches



Logan Clutch Corporation®
manufacturers of clutches and brake products

- Industrial
- Marine
- Mobile
- Rail
- Oil & Gas

Family owned and operated since 1975, Logan offers a complete line of fluid / air actuated multiple disc clutches, brakes, PTO Clutches and clutch discs for a variety of wet and dry clutch and brake applications.

Markets include: Machine Tool, Industrial, Marine, Irrigation, Rail, Oil Field, and Off-Highway industries.

Applications include: Pump Drives, Trenchers, Tunnel Boring and Snow Removal Equipment, Single and Multi-Speed Transmissions, Marine Transmissions, Work Boats, Escort Vessels, Marine Z-drives, Machine Tools, Screw Machines, Conventional and High Performance friction and steel clutch discs.

Logan Sales, Engineering and Customer service personnel are available to answer questions regarding catalog specs, parts and service details, and inquiries regarding your specific design requirements. We certainly thank you for your interest, and look forward to being of further service.

Logan Front of Engine Power Take-Off (PTO) Clutches



Simple, Efficient, High-Torque Design

Logan PTO's are used in a variety of Industrial, On-Highway, Marine, Construction, Agriculture, Mining, Oil Field, and Rail applications – and are designed to mount between the power take-off of the engine and auxiliary attachment, i.e. single or multi-station pump drive.

PTO Clutch Applications

- Single and Multi-Station Pumps
- Mobile or Stationary Auxiliary Drives
- Connect / Disconnect Direct Drives
- Winches, Reels, Hoists and more

Features

- Heavy-duty, self-contained corrosion resistant design requires no external lubrication
- Air or Hydraulically actuated; self-adjusting, multiple disc pack design
- Smooth engagement / disengagement
- Simplified, compact, high torque design
- Remote activation from a control panel or operator's station
- Optional manual engagement screws in case power flow is disrupted
- Optional shaft adapters for Dana style flanges
- American Bureau of Shipping (ABS) type approval
- Oil bath or flow through cooling



Advantages

- Reduces fuel consumption and CO2 Emissions by engaging drives and pumps only when required
- Easier engine starts: Lowers horsepower draw and cranking power required during machine start-up by disconnecting the hydraulic system from the engine
- Reduces ambient noise through intermittent use of pumps and equipment
- Cooler running hydraulic systems: Heat is generated whenever oil dumps from high to low pressure without producing work. Disconnecting the PTO Clutch reduces the destructive effects of heat – lowering maintenance costs and hydraulic oil requirements
- Extends the life of drive systems and components



Logan 600 Series Front of Engine Power Take-off (PTO) Clutch Pictured on a Typical Genset.
163 HP (120 kW) @1800 RPM



Logan 600 Series transmits 741 lb. ft. of torque (1004 kW) @ 100 psi (7 bar) / 1084 lb. ft. (1469 kW) @ 140 psi (9.5 bar).
Max engagement speed is 1800 RPM.
Clutch shown with cover plate removed.

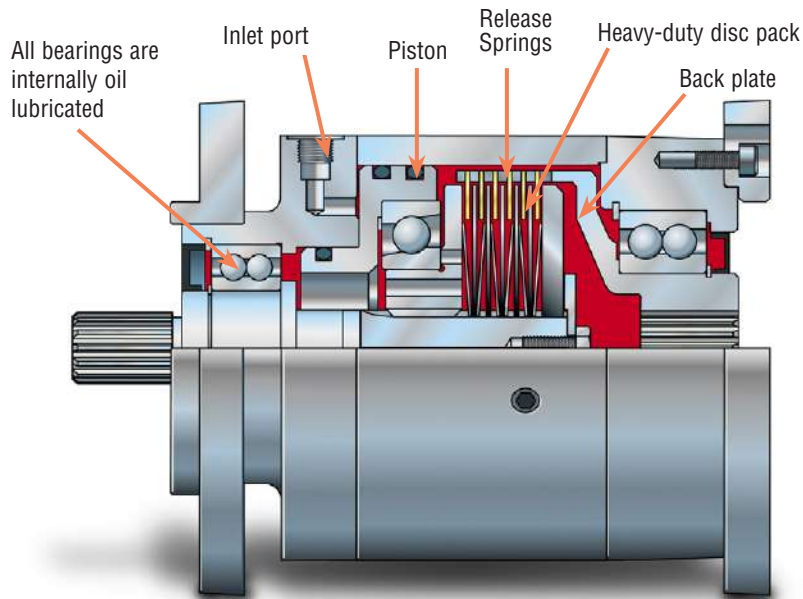


Logan support brackets are engineered to ensure precise crank shaft alignment to simplify field or factory installation.



Logan Power Take-off (PTO) Clutches - How They Work

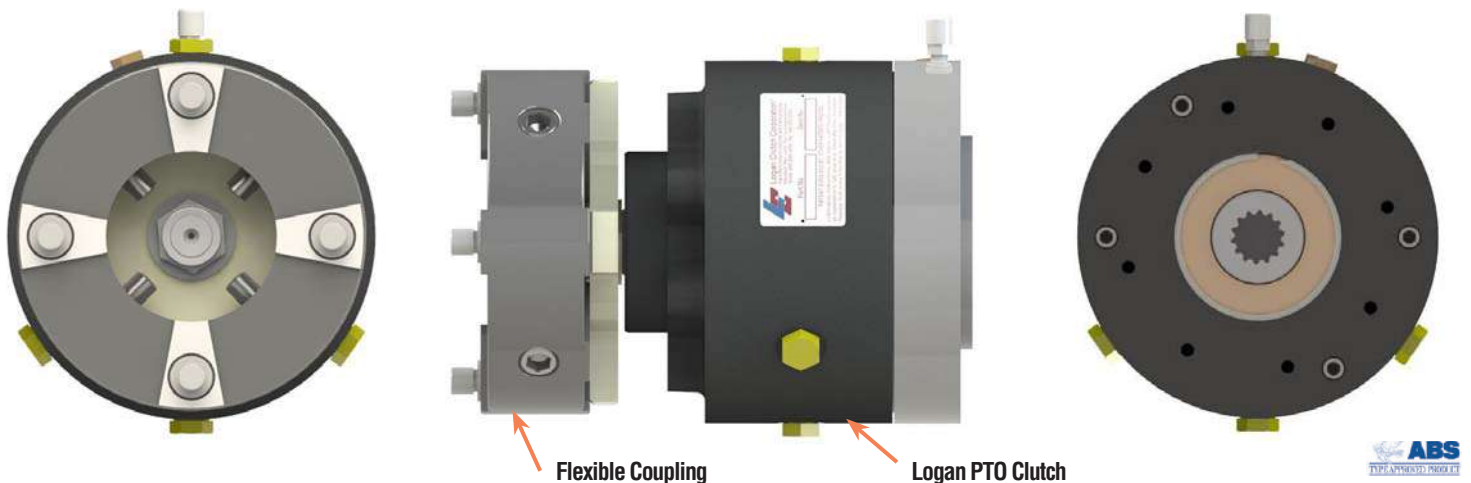
Logan PTO clutches are Hydraulically or Pneumatically actuated. Pressurizing the cylinder, forces the piston to clamp and lock the friction and separator discs. When pressure is removed, release springs separate the separator discs and maintain a running clearance between separator and friction discs.



- Heavy duty, self-adjusting, disc pack
- Rugged, lightweight corrosion-resistant enclosure does not require external shielding
- High-alloy shafts for maximum strength
- Modified standards available for specific design requirements
- Optional manual engagement screws in case power flow is disrupted

Front Mount Power Take-Off (PTO) Clutch with Flexible Coupling

The Logan SPF Series Clutch integrates a flexible coupling into the design to mitigate vibration from torsionally active diesel or gasoline engines. The durometer of the flexible coupling is designed to absorb typical vibration stemming from diesel engines. Modified couplings are available to meet specific customers applications.



A fixed orifice pressure regulating valve should be specified in the system to prevent over-pressurization of any Logan Clutch PTO. The Logan warranty does not cover clutch failure due to over-pressurization. The highest pressure values in the torque tables are maximum ratings for Logan Clutches.

Torsional Damping Devices for Logan Products: Torsional compatibility tests rest solely with the assembler and user. Logan accepts no liability for noise, vibration, and premature failure of Logan PTO's or damage to clutch hubs and splines caused by incorrectly specified torsional damping devices, or engine vibration. It is the buyer's responsibility to specify this option, which can result in additional cost and a possible increase in installation length. Logan can accept no liability for personal injury, loss of life, or damage or loss of property due to the failure of the buyer to improperly apply Logan Products.

All rotating components present a potentially hazardous condition and should be guarded in accordance with OSHA requirements and other applicable laws, regulations and industrial standards.

Logan Clutch Corporation reserves the right to modify product specifications and designs without notice and without incurring obligations. Torque values are based upon wet disc packs having full contact between surfaces.

Logan Front of Engine Power Take-off (PTO) Clutches



Logan Front of Engine PTO's

In this example, the customer utilizes the Logan SPF 1000 Series, Front of Engine PTO Clutch to drive a pump, which controls the port and starboard bow and tunnel thrusters, as well as hydraulic capstan winches. The Scania D13 Series, 650 HP (478 kw) diesel engine utilizes a Logan LC-314 Bell Housing PTO (2701 lb. ft. / 3664 Nm) for main propulsion, along with the Logan SPF series 1000 PTO clutch for auxiliary power.

Since power can be on demand from the front of the engine, ship architects and owners now have the option to eliminate an auxiliary genset; leaving more space in the engine room, lower build costs, and lower emissions.



Scania D13 Series 650 HP (478 kW) pictured with Logan LC-314 Bell PTO 2702 lb. ft. (3664 Nm) for main propulsion and Logan front PTO 1000 series clutch, 1590 lb. ft. (2155NM) to drive an auxiliary pump



Fluid /Air Actuated, and Self Adjusting



Logan Front PTO's act as connect/disconnect for auxiliary pumps

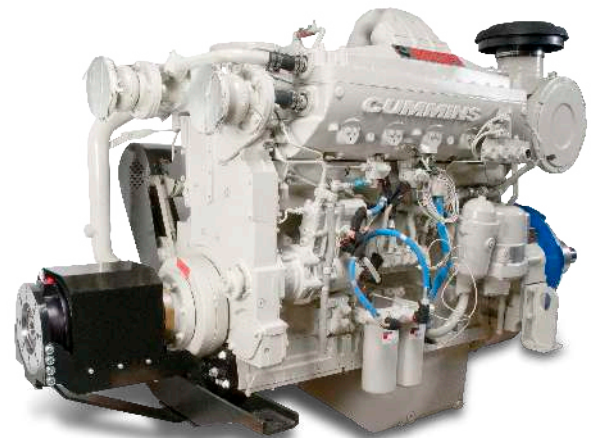
Logan Front of Engine PTO's for Marine Diesel Engines and Generator Sets

Features:

- Air or fluid actuated
- Integrated torsional isolation coupling
- Engineered mounting bracket for precise alignment
- Maximum torque, small envelope, higher engagement speeds (up to 1800 RPM with soft start feature)
- Low profile, compact, design is suitable for workboats, fishing boats and pleasure craft
- The Logan PTO aids in the reduction of emissions, fuel costs and wear and tear on auxiliary attachments

Advantages:

- Up to 100% power off the front of your engine, may eliminate the need for additional auxiliary power
- During maneuvering – which requires reduction of main engine speed, the Logan PTO is used as a separate power source for bow and stern thrusters
- The PTO directly connects to a pump drive, which powers winches, reels, hoists, and deck pressure washers
- The PTO can be coupled to an alternator to supply electric power to other power consumers on the vessel



Engine shown with Logan front PTO and bracket assembly



Modern tug boat equipped with twin gensets.



Up to maximum available power off the front of your engine.



High-Volume Fi-Fi System Puts Vessel Ahead

Logan Clutch, Moose Boats and Cummins Pacific have teamed up to create the most capable fire boat package in the business.

Marine diesel engine specialist Cummins Pacific LLC and Logan Clutch have teamed up with Moose Boats Inc to deliver a new vessel, with outstanding fire pump capability, to West Pierce Fire and Rescue in University Place, Washington.

Moose Boats, a boat designer and manufacturer based in the San Francisco Bay Area, was awarded the contract to build a M2-37 catamaran fire rescue boat. The 37 ft. aluminium catamaran is powered by the newly-introduced twin Cummins 6.7 ltr.

425 hp turbo diesels and propelled by Hamilton 292 water jets. The vessel will provide West Pierce Fire and Rescue with fire-fighting, rescue, dive and shore-landing capabilities.

It features a unique fire pumping arrangement, with dual 4,546 litres/min fire pumps and a remote control fire monitor rated for 9,092 litres/min, as well as an electrically-operated bow door. The bow door arrangement maximizes the vessel's forward deck arrangement for emergency response and represents a new evolution in Moose Boats' overall engineering and design capabilities.

West Pierce Fire and Rescue's M2-37 Endeavor is also equipped with 5 in diameter discharges in the cockpit and foredeck, for supplying water to land-based fire apparatus or hydrant systems.

Logan Clutch president, Andrew Logan, said: "Moose Boats and Cummins approached Logan and asked if we could come up with an engineered clutch solution for users, such as fire-fighting boats, with large auxiliary power take-off (PTO) requirements.

"Logan designed the bracket for the Cummins QSB 6.7, by collaborating with the Cummins engineers in Charleston, South Carolina. We also produced a solid model, and conducted a finite element analysis (FEA), using data supplied by Cummins."

Unlike previous fireboat arrangements, the Cummins/Logan Clutch system, packaged with a jet drive, enables full authority maneuvering from both engines while pumping at full pressure and flow. At 2,100 rev/min, the Cummins QSB 6.7 engine provides 140 hp at the jet, with 150 hp available for the fire pump. With 6kW of electrical generating power from two engines, and the ability to drive freon compressors, a marine generator set might not be necessary in many small boat applications.

The Logan PTO installed is the SAE PTO 600—a low-profile, compact design suitable for workboats, fishing boats and pleasure craft. During maneuvering, the Logan PTO can be used as a separate power source for bow and stern thrusters. It can also directly connect to a pump



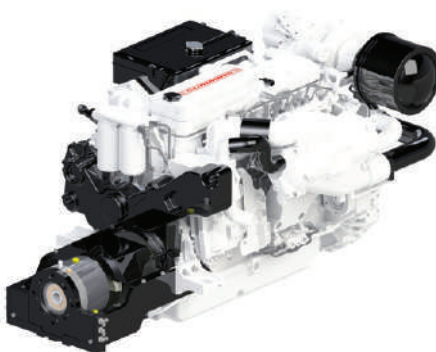
West Pierce Fire and Rescue crew onboard their vessel.

drive — which could power winches, reels, hoists and deck pressure washers — and can be coupled to an alternator to supply electric power to other power consumers on the vessel.

Moose Boats sales engineer Mark Stott said: "The collaborative and seamless design approach with Cummins and Logan Clutch allowed Moose Boats to achieve a high-volume fire-fighting system without sacrifice of our philosophy that vessel maneuverability is paramount during marine fire-fighting scenarios."

The Logan arrangement increased the previously available flow threefold — to 12,274 litres/min via two 4,546 litres/min-rated pumps — and added fire pump redundancy.

Stott added: "Logan Clutch delivered a fully-engineered, turnkey FPTO clutch and overhung load adapter application, which has proven performance on three individual Moose Boats M2 catamaran projects to date: Sandwich Fire and Rescue, West Pierce Fire and Rescue and Richmond Fire Department here on San Francisco Bay."



QSB 6.7 with Logan PTO 600 Front Mount Kit.



The Sandwich Fire and Rescue boat displaying the outstanding fire-fighting flow of the Logan PTO.

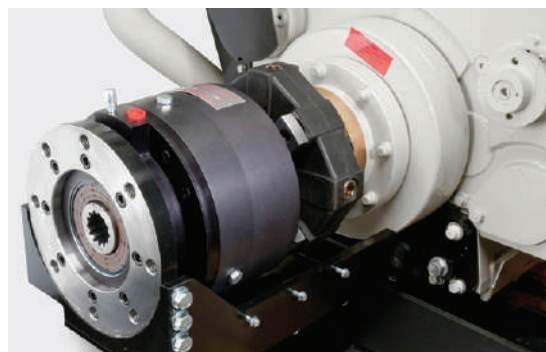
Technical specification

Logan SAE PTO 600

- Air or fluid actuated.
- Maximum torque up to 912 ft.-lb/1,237 Nm, and 600 ft.-lb/ 813 Nm of continuous duty torque.
- Integrated Centaflex A torsional isolation coupling.
- Engagement up to 1,800 rev/min with optional soft-start.
- Installs in minutes with simple hand tools.
- Engineered mounting bracket for precise alignment.

Cummins QSB 6.7

- Full-rated power capability for every engine up to 480hp.
- SAE and metric mounting flanges available.



Logan 600 series, direct-drive PTO with Centaflex coupling and engineered Logan bracket.



Simplified Selection Procedure

Determine pump face and shaft requirements.
Determine method of actuation. Select clutch with correct mounting flange and shaft from page 9-12.

Clutch Selection Procedures

- I Calculate the torque requirement for the application using one of the following formula

$$\text{Torque (Lb./Ft.)} = \frac{\text{HP} \times 5250}{\text{RPM}} \quad \text{or} \quad \text{Tc (Nm.)} = \frac{\text{kW} \times 9550}{\text{RPM}}$$

- II Identify the service factor which best identifies your application from the suggested service factor table.

- III Adjust the torque requirement using the selected service factor.

$$\text{Clutch/Brake Torque Capacity (Tc or Tb)} =$$

$$\frac{\text{Gross Torque Capacity (T)}}{\text{Safety Factor (SF)}}$$

$$T = Tc \times SF \quad \text{or} \quad T = Tb \times SF$$

- IV. Decide which series best fits your drive.

- V. Using the appropriate series torque pressure to determine the model size.

- VI. Determine if the Series and models will:

- 1) Accommodate the shaft key, or spline
- 2) Operate at the required speed
- 3) Fit within the available space

- VII. Determine the Support/Mounting

- VIII. Call, e-mail or fax Logan Clutch Corporation to review your selection and place your order.

HP = Horsepower
RPM = Clutch or Brake shaft speed
WR2 = Total inertia to be stopped (lb.ft.²)
T = Required Torque (Lb./ Ft., Nm, Lb./in)
Tc = Clutch Torque (Lb./ Ft., Nm, Lb./in)
Tb = Brake Torque (Lb./ Ft., Nm, Lb./in)
t = Time to stop (seconds)
SF = Safety Factor

Torque & Horsepower Formulas

$$\text{HP} = \frac{T(\text{Lb./Ft.}) \times \text{RPM}}{5250}$$

$$\text{Torque (Lb./Ft.)} = \frac{\text{HP} \times 5250}{\text{RPM}}$$

$$\text{HP} = \frac{T(\text{Lb./In.}) \times \text{RPM}}{63025}$$

$$\text{Torque (Lb./In.)} = \frac{\text{HP} \times 63025}{\text{RPM}}$$

$$\text{kW} = \frac{T(\text{Nm.}) \times \text{RPM}}{9550}$$

$$\text{Torque (Nm.)} = \frac{\text{kW} \times 9550}{\text{RPM}}$$

Torque Conversion Calculators

	Multiplier
Newton meters (Nm.) to Pound inches (lb.in.)	8.851
Pound inches (lb. in.) to Newton meters (Nm.)	0.113
Newton meters (Nm.) to Pounds feet (lb. ft.)	0.738
Pounds feet (lb.ft.) to Newton meters (Nm)	1.356

Horsepower Conversion Calculators

	Multiplier
Horsepower (HP) to kW (Kilowatt)	0.7457
Kilowatt (kW) to Horsepower (HP)	1.341

Pressure Conversion Calculators

	Multiplier
Bar to pounds per square inch (psi)	14.5
Pounds per square inch (psi) to Bar	0.068

Measurement Conversion Table

	Multiplier
Millimeters (mm) to Inches (in)	0.03937
Inches (in) to Millimeters (mm)	25.4

Weight Conversion Table

	Multiplier
Pounds (Lbs.) to Kilograms (Kg.)	0.0453
Kilograms (Kg.) to Pounds (Lbs.)	2.205

Volume Conversion Table

	Multiplier
Gallons (Gal.) to Liters (Ltr.)	3.785
Liters (Ltr.) to Gallons (Gal.)	0.2642

Suggested Safety Factor Table

Duty	SF
Small Inertia Low Cycle Rate Non-pulsating Load	1.3 to 1.7
Large Inertia Low Cycle Rate Non-pulsating Load	1.7 to 2.2
Small Inertia High Cycle Rate Pulsating Load	2.2 to 3.2

Power Train Efficiency Service Factor Table

Gear Belt	0.98
V Belt	0.97
Gearbox	0.96



SPF Series Power Take-Off (PTO) Specifications



PTO Clutch with integral flexible coupling

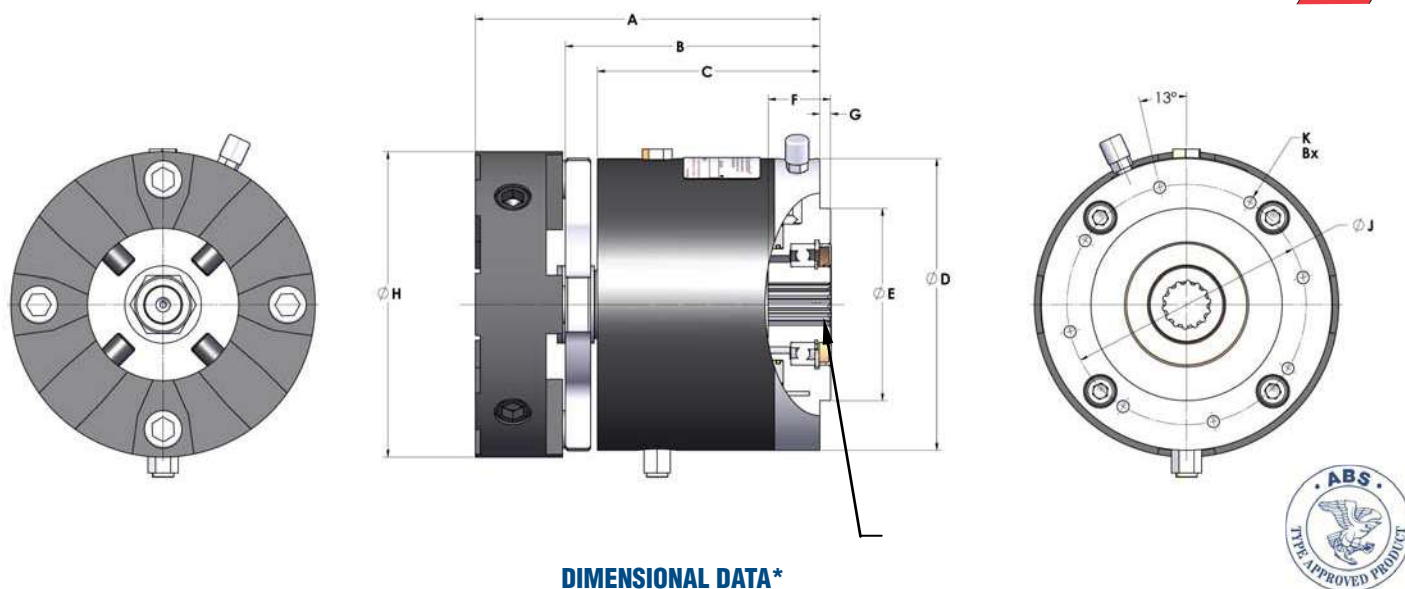
SPF Series PTO – Direct Drive with Flexible Coupling

PTO Clutch with integral flexible coupling for
torsionally active, In-line applications

Features:

- Air or Fluid Actuated
- Self-Adjusting Disc Pack
- Smooth Engagement-Disengagement
- Integral torsional coupling for in-line applications
- Available in B, C, D, E and F spline,
plus bore and key configurations

SPF PTO 400 Specifications



DIMENSIONAL DATA*

DIMENSIONS IN INCHES									
9.00	6.65	5.81	7.59	5.00	1.63	0.28	7.87	6.25	3/8-16 UNC
A	B	C	D	E	F	G	H	J	K (x8)
229	168.9	147.6	192.8	127.0	41.4	7.1	200	158.8	3/8-16 UNC
DIMENSIONS IN MILLIMETERS									

SPF 400 Actual Static Torque****			
Standard Units	Lbs.-Ft.	514	523
	PSI	100	320
Metric Units	Bar	6.9	22
	Nm	697	709

SPF 400 Specifications

	U.S.	S.I.
* Rated Static Torque (Maximum)	400 ft.lbs.	542 Nm
Maximum HP/kW	180 HP	134 Kw
*Maximum RPM Under Load	2400 RPM	2400 RPM
*Recommended Engagement Speed	Idle	Idle
Rotation	Bi-rotation	Bi-rotation
Maximum Actuation Pressure	100 or 320 PSI	6.9 or 22 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Maximum Actuation Back Pressure to Tank	7 PSI	.50 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
External Finish - Output Hub	Alloy Steel	Alloy Steel
Housing	Anodized	Anodized
Weight (Approx.)	29 Lbs.	13 Kg

NOTES:

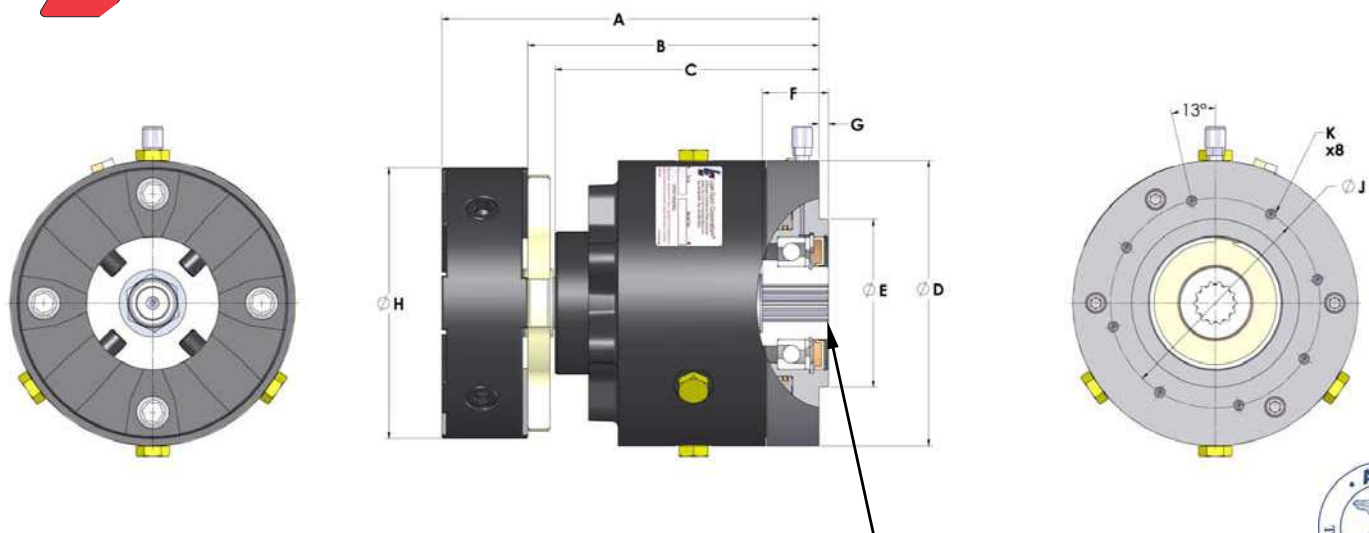
- * Standard configuration. Modified standards available. Soft start feature may be required for engagement above machine idle RPM.
- ** Logan SPF PTO 400 Series clutches are available in two (2) different actuation pressures. Refer to part number to determine model configuration.
- *** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.
- **** Torque ratings based on using ATF fluid as a lubricant. When selecting clutch size, it is recommended to select a clutch with at least 50% more torque than required for factor of safety.

Disclaimer:

All data and dimensions are for reference only. Please contact Logan Clutch for detailed information.



SPF PTO 600 Specifications



DIMENSIONAL DATA*



DIMENSIONS IN INCHES									
11.31	8.69	7.87	8.50	5.00	1.97	0.28	8.07	6.25	3/8-16 UNC
A	B	C	D	E	F	G	H	J	K (x8)
287.3	220.7	199.9	215.9	127.0	50.0	7.1	205.0	158.8	3/8-16 UNC
DIMENSIONS IN MILLIMETERS									

SPF 600 Actual Static Torque****			
		6100 Series	6200 Series
Standard Units	Lbs.-Ft.	912	985
	PSI	120	200
Metric Units	Bar	8.3	13.8
	Nm	1237	1336

SPF 600 Specifications

	U.S.	S.I.
* Rated Static Torque (Maximum)	600 ft.lbs.	813 Nm
Maximum HP/kW	342 HP	255 Kw
*Maximum RPM Under Load	3000 RPM	3000 RPM
*Recommended Engagement Speed	Idle	Idle
Rotation	Bi-rotation	Bi-rotation
**Maximum Actuation Pressure	120 or 200 PSI	8.3 or 13.8 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Maximum Actuation Back Pressure to Tank	7 PSI	0.5 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
Displacement: 6100 Series (New/Worn)	3.3/5.1 in ³	54/83.5 cm ³
6200 Series (New/Worn)	2.4/3.6 in ³	39.3/59 cm ³
Weight (Approx.)	47 Lbs.	21 Kg

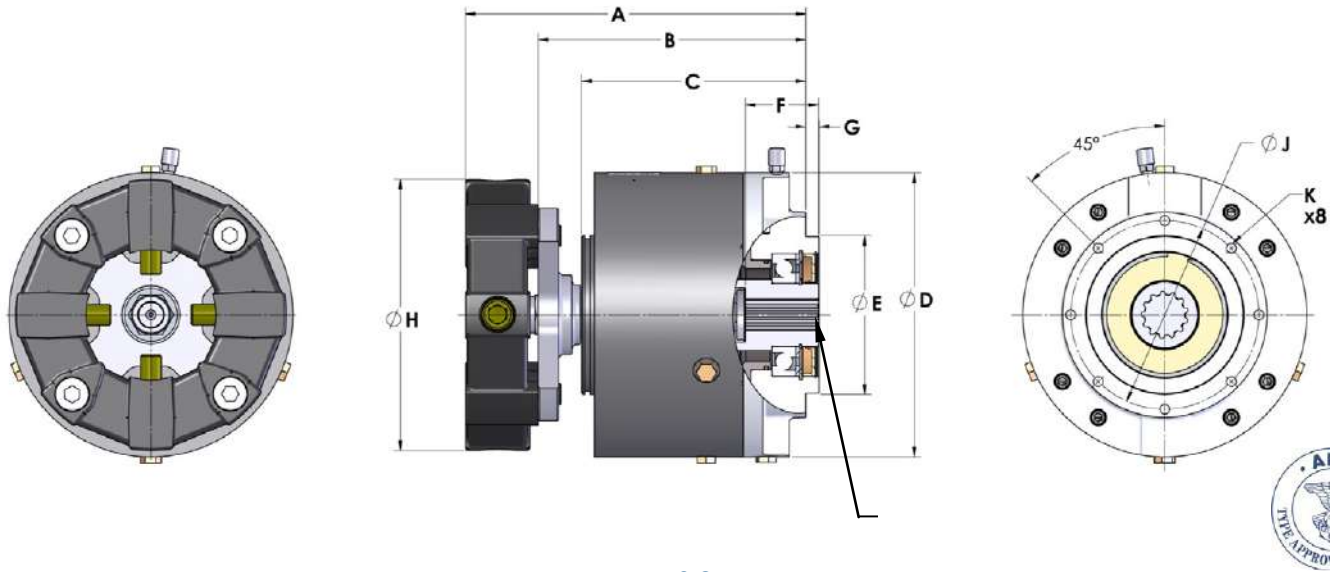
NOTES:

- * Standard configuration. Modified standards available. Soft start feature may be required for engagement above machine idle RPM.
- ** Logan SPF PTO 600 Series clutches are available in two (2) different actuation pressures. Refer to part number to determine model configuration.
- *** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.
- **** Torque ratings based on using ATF fluid as a lubricant. When selecting clutch size, it is recommended to select a clutch with at least 50% more torque than required for factor of safety.

Disclaimer:

All data and dimensions are for reference only. Please contact Logan Clutch for detailed information.

SPF PTO 1000 Specifications



DIMENSIONAL DATA*

DIMENSIONS IN INCHES									
12.90	10.14	8.50	10.75	6.00	2.78	0.50	10.25	7.13	3/8-16 UNC
A	B	C	D	E	F	G	H	J	K (x8)
327.7	257.6	215.9	273.1	152.4	70.6	12.7	260.1	181.0	3/8-16 UNC
DIMENSIONS IN MILLIMETERS									

SPF 1000 Actual Static Torque****			
Standard Units	Lbs.-Ft.	1600	1600
	PSI	120	320
Metric Units	Bar	8.6	22.1
	Nm	2170	2170

SPF 1000 Specifications

	U.S.	S.I.
* Rated Static Torque (Maximum)	1000 ft.lbs.	1356 Nm
Maximum HP/kW	570 HP	425 Kw
*Maximum RPM Under Load	3000 RPM	3000 RPM
*Recommended Engagement Speed	Idle	Idle
Rotation	Bi-rotation	Bi-rotation
**Maximum Actuation Pressure	120 or 320 PSI	8.6 or 22.1 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Maximum Actuation Back Pressure to Tank	7 PSI	.50 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
External Finish - Output Hub	Alloy Steel	Alloy Steel
Housing	Anodized	Anodized
Weight (Approx.)	69 Lbs.	32 Kg

NOTES:

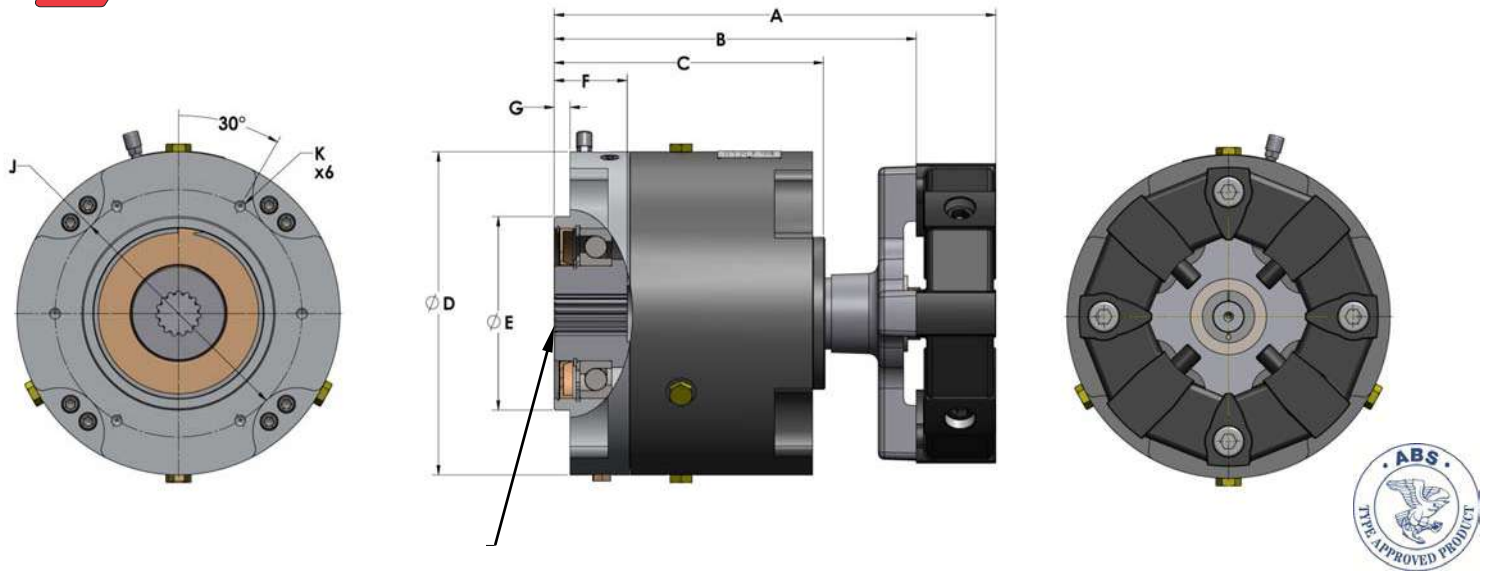
- * Standard configuration. Modified standards available. Soft start feature may be required for engagement above machine idle RPM.
- ** Logan SPF PTO 1000 Series clutches are available in two (2) different actuation pressures. Refer to part number to determine model configuration.
- *** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.
- **** Torque ratings based on using ATF fluid as a lubricant. When selecting clutch size, it is recommended to select a clutch with at least 50% more torque than required for factor of safety.

Disclaimer:

All data and dimensions are for reference only. Please contact Logan Clutch for detailed information.



SPF PTO 1500 Specifications



DIMENSIONAL DATA*

DIMENSIONS IN INCHES

17.53	14.296	10.694	11.81	7.625	2.880	0.625	9.750	1/2-13 UNC
A	B	C	D	E	F	G	J	K
445.3	363.13	271.63	300	193.68	73.19	15.88	247.65	1/2-13 UNC

DIMENSIONS IN MILLIMETERS

SPF 1550D Actual Static Torque****

Standard Units	Lbs.-Ft.	2695	2695
	PSI	120	320
Metric Units	Bar	8.6	22.1
	Nm	3654	3654

SPF 1550D Specifications

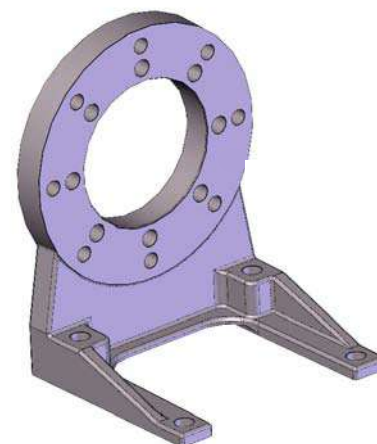
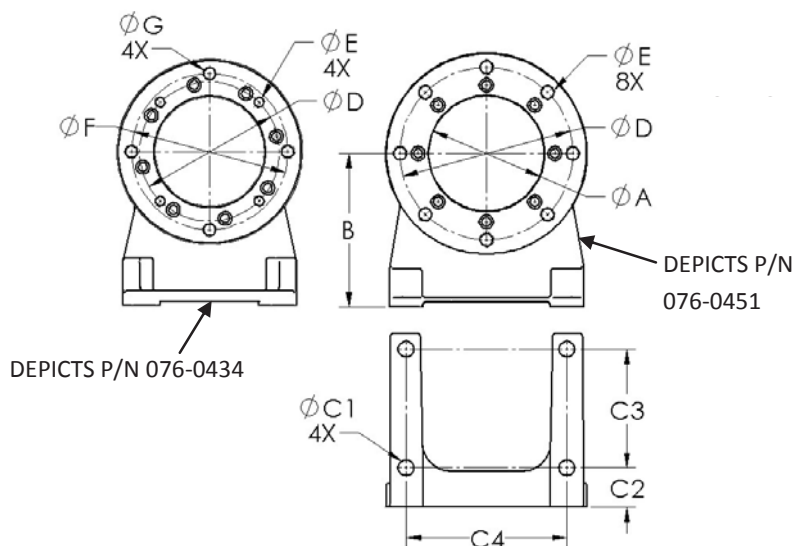
	U.S.	S.I.
* Rated Static Torque (Maximum)	1500 ft.lbs.	2034 Nm
Maximum HP/kW	800 HP	596 kW
*Maximum RPM Under Load	2000 RPM	2000 RPM
*Recommended Engagement Speed	Idle	Idle
Rotation	Bi-rotation	Bi-rotation
**Maximum Actuation Pressure	120 or 320 PSI	8.6 or 22.1 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Maximum Actuation Back Pressure to Tank	7 PSI	.50 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
External Finish - Output Hub	Alloy Steel	Alloy Steel
Housing	Anodized	Anodized
Weight (Approx.)	152 Lbs.	69 Kg

NOTES:

- * Standard configuration. Modified standards available. Soft start feature may be required for engagement above machine idle RPM.
- ** Logan SPF PTO 1500 Series clutches are available in two (2) different actuation pressures. Refer to part number to determine model configuration.
- *** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.
- **** Torque ratings based on using ATF fluid as a lubricant. When selecting clutch size, it is recommended to select a clutch with at least 50% more torque than required for factor of safety.

Disclaimer:

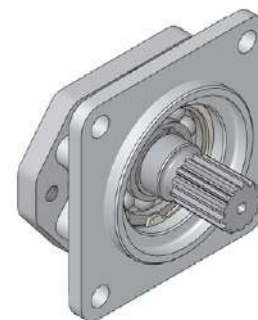
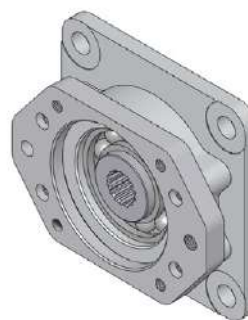
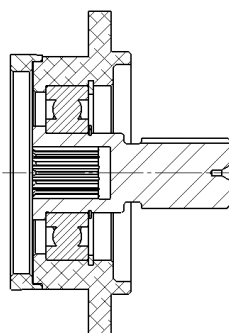
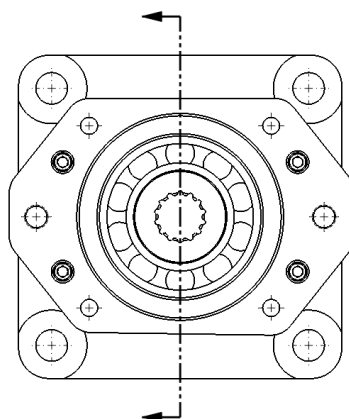
All data and dimensions are for reference only. Please contact Logan Clutch for detailed information.



Engine Front Mount
Clutch Accessories

Foot Bracket Matrix

USED WITH	PART NUMBER	FEMALE SIDE
PTO300/SPF400	076-0741	2/4 BOLT B
PTO600/SPF600	076-0434	2/4 BOLT C
PTO1000/SPF1000	076-0451	2/4 BOLT D
PTO1200/SPF1500	076-0722	4 BOLT E
PTO1500/SPF1500	076-0658	4 BOLT F



402 Adapter

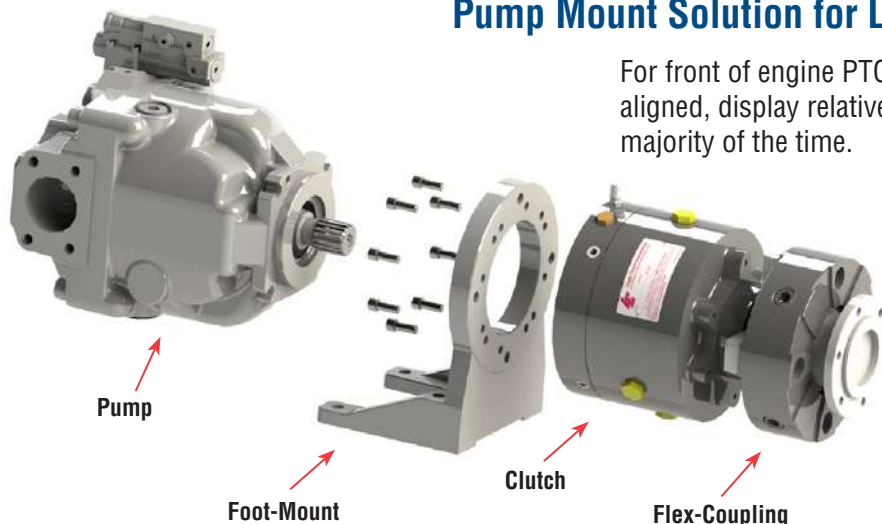
PART NUMBER	MALE SIDE	FEMALE SIDE
402-0028	2/4 BOLT B with 13t B SPLINE	2 BOLT A with 9t A SPLINE
402-0035	4 BOLT C with 17t C-C SPLINE	2/4 BOLT B with 15t B-B SPLINE
402-0025	4 BOLT D with 13t D SPLINE	2/4 BOLT C with 14t C SPLINE



Power Take-off (PTO) Clutch Mounting Options

Pump Mount Solution for Low Torsion Applications

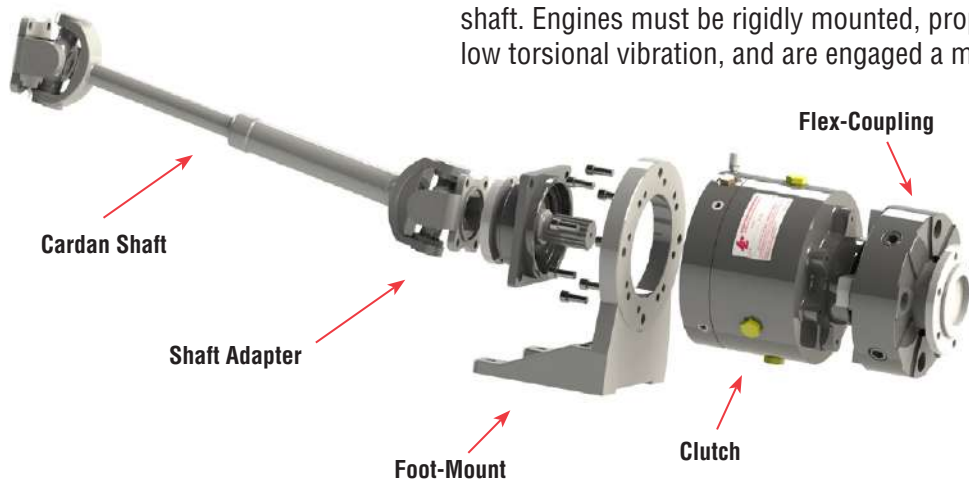
For front of engine PTO applications that are rigidly mounted, properly aligned, display relatively low torsional vibration, and are engaged a majority of the time.



- Economical solution
- Short installation length
- Rigidly mounted engines only
- For engines with low torsional vibration
- Best for use in applications that run with clutch principally engaged
- For use with applications with low operational misalignment

Cardan Shaft Solution for Low Torsion Applications

For front of engine PTO applications where the output desired is a drive shaft. Engines must be rigidly mounted, properly aligned, display relatively low torsional vibration, and are engaged a majority of the time.

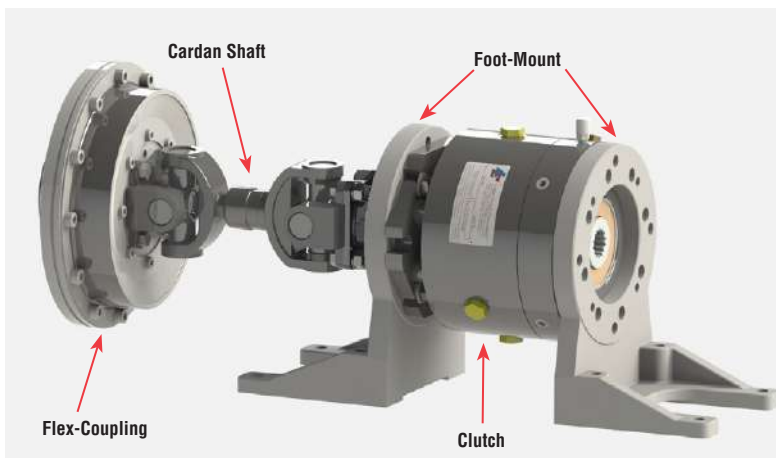


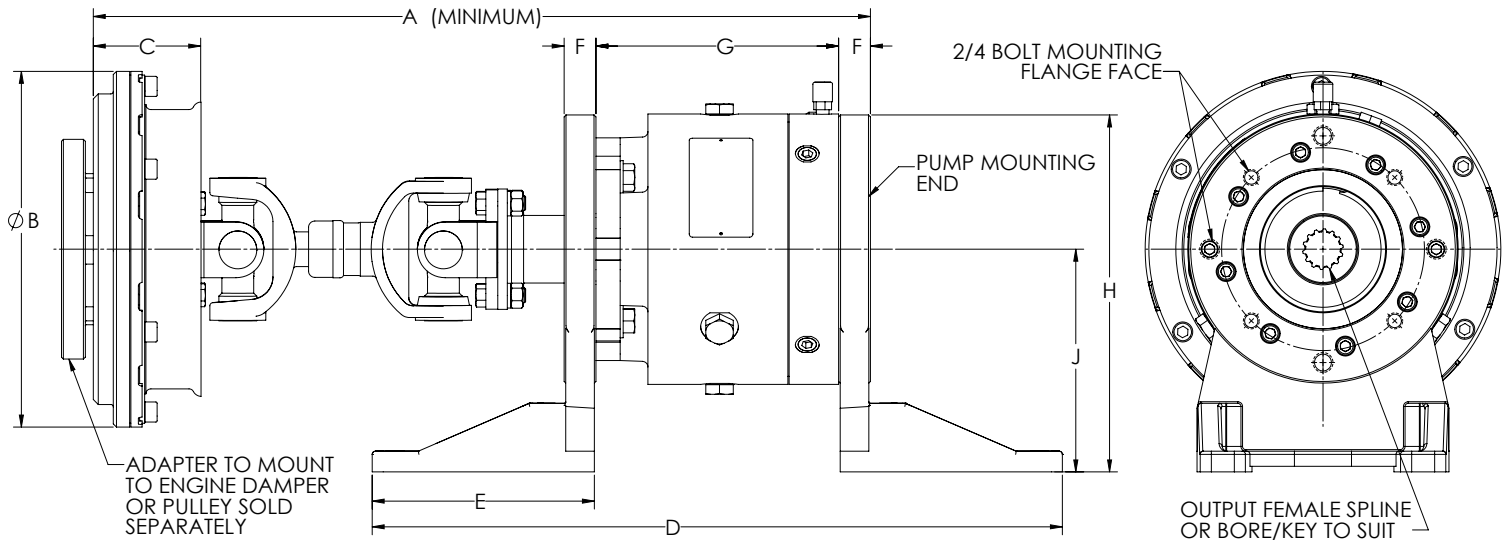
- Economical solution
- Rigidly mounted engines only
- Used with engines with low torsional vibration
- Used in applications that run with clutch principally engaged
- For use with applications with low operational misalignment

Logan Universal Front of Engine PTO's incorporate an integral flexible coupling, clutch cardan shaft and bracket arrangement, and are specified when an engineered bracket design is not practical or required for the application. Works with most new and legacy engines and can be installed with fewer alignment procedures.

- Resilient or rigid mounted engines
- Simple installation procedure
- For installations that require maximum torsional vibration protection
- Used in applications that run with clutch engaged or disengaged
- For use with applications with moderate to high operational misalignment

Universal Front of Engine PTO™





DIMENSIONS IN INCHES***										Lb. Ft.	
900-LC20	24.40	11.18	3.39	21.70	7.00	1.00	7.63	11.22	7.00	600	SAE C
900-LC21	26.00	14.09	3.82	26.18	9.06	1.25	8.00	13.24	8.00	1000	SAE D
900-LC22	28.20	14.02	4.27	N/A	N/A	1.40	9.48	16.00	8.00	1500	SAE F
900-LC23	Contact Logan Engineering for data									1200	SAE E
900-LC24	Contact Logan Engineering for data									300	SAE B
	A****	B	C	D	E	F	G	H	J	RATED TORQUE	2/4 Bolt* OUTPUT**
900-LC20	620.5	284.0	86.1	551.1	177.8	25.4	193.8	285.0	177.8	813	SAE C
900-LC21	660.5	358.0	97.0	665.0	230.1	31.8	203.2	336.3	203.2	1356	SAE D
900-LC22	716.2	356.1	108.5	N/A	N/A	35.6	240.8	406.4	203.2	1627	SAE F
900-LC23	Contact Logan Engineering for data									2034	SAE E
900-LC24	Contact Logan Engineering for data									407	SAE B
DIMENSIONS IN MILLIMETERS										Nm	

- * Standard configuration. Modified standards available. Soft start feature may be required for engagement above machine idle RPM.
- ** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.
- *** Dimensions for reference only. Refer to Logan Engineering drawing or 2D or 3D model for complete and accurate dimensions and installation notes.
- **** Approximate minimum length assembly shown. Actual length varies slightly due to shaft slip joint allowance and proper universal joint shaft installation requirements. For systems with high operational misalignment requirements, a longer shaft may be required.





Engineered Solutions for OEM Applications



Front of Engine PTO for Deere 4045T 99kW Engine

Front of Engine PTO - Engineered Solutions

The ultimate engineered kit solution for OEM applications. Designed in conjunction with the engine OEM, this system provides the most highly engineered front mounting used with any type of engine mounting in a boat. Installation is simply made using only hand tools. The kit allows the engine and front mount package to be pre-assembled in a factory setting and shipped complete for installation into the boat. Total cost of installation can be lowest with this type of front mount kit as it requires the least amount of custom design work at the time of installation.

Advantages:

- Soft or rigidly mounted engines
- Simple installation procedure
- For installations that require maximum torsional vibration protection
- Used in applications that run with clutch engaged or disengaged
- Attachment to engine minimizes operational misalignment
- Engineered kit speeds installation

Cat	C4.4 Generator
	C6.6 Generator
	C7.1 Generator
	C7.3 Propulsion
	C9 Propulsion
	C32 Propulsion & Generator
Cummins	QSB6.7
	QSB7-DM
	QSC 8.3
	QSL9
	QSM11
	QSK19
John Deere	4045
	6068
	6090
	6135
Scania	12L
	13L
	16L
Volvo	D11
	D13
	D16
Mitsubishi	S6R

Logan SAE PTO / SPF PTO Pneumatic Actuation



Operation: Logan Direct Drive SAE PTO's require a 2 position valve to function properly, (if the solenoid is not activated, air will not pass through the valve).

A pressure switch must be installed in the inlet line to ensure that a minimum of 90 psi (6.2 bar) is available prior to clutch engagement.

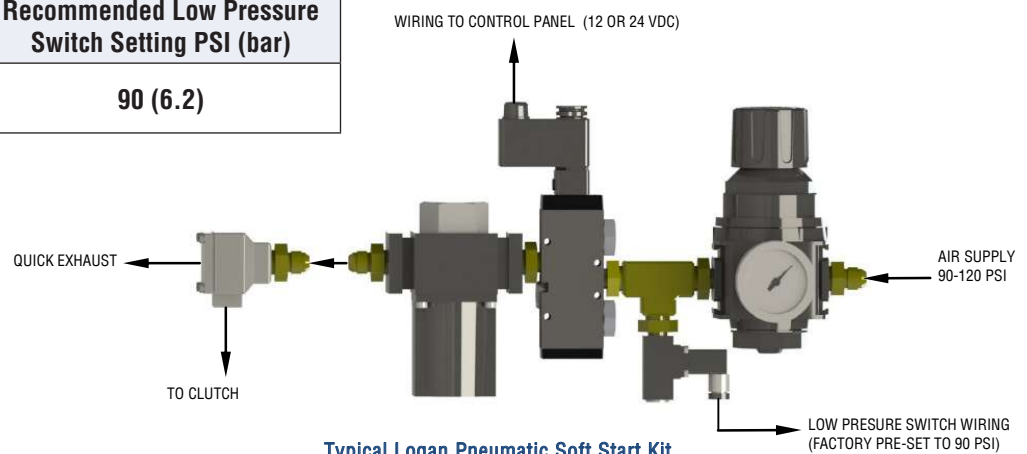
Pressures exceeding 120 psi (8 bar) will cause back plate deflection and premature clutch failure.

SOFT START™ FEATURE/STANDARD: Autopilot Soft Start valve is preset to 2 to 3 sec. ramp-up using required air pressure.

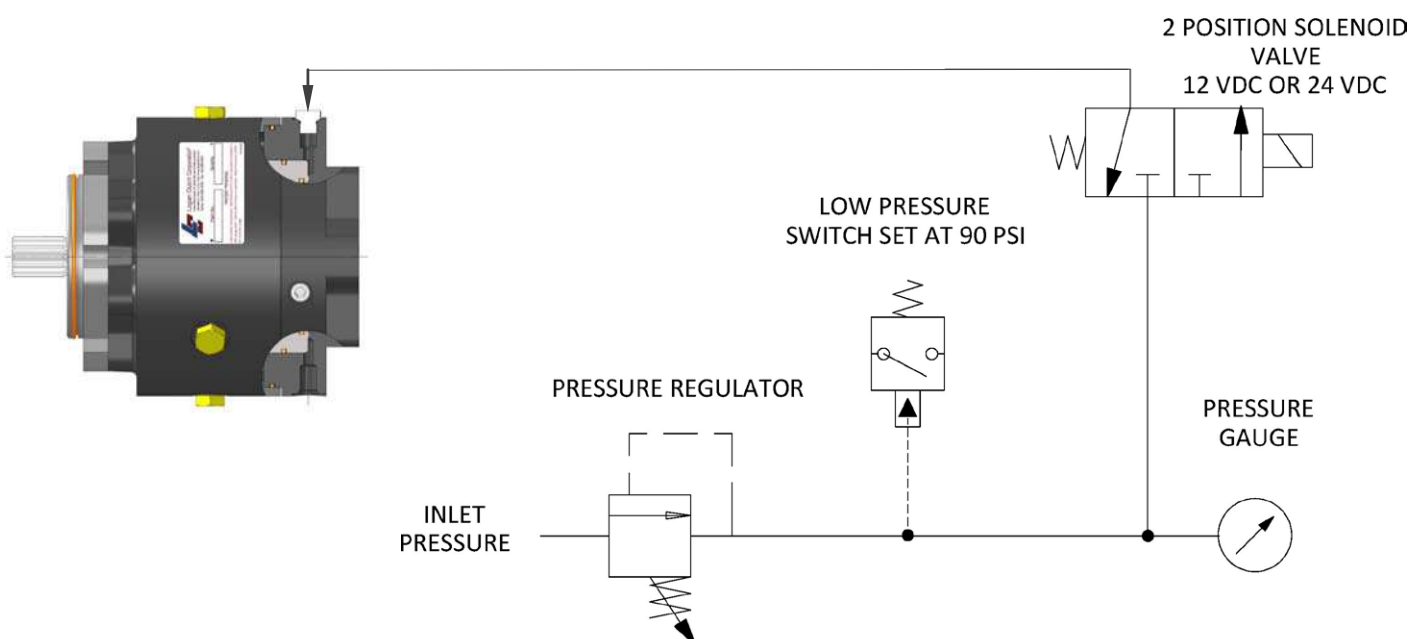
A 20-micron filter element must also be installed before the switch to minimize excessive dirt, oil and moisture. If an air source is not readily available on your equipment, Logan suggests using an air compressor capable of producing 0.14 SCFM at 120 psi (8 bar), with an air dryer with operating range between -4° F to 125°F (-20°C to 52° C).

An ATEX option is available.

Maximum Clutch Actuation Option PSI (bar)	Recommended Low Pressure Switch Setting PSI (bar)
120 (8.3)	90 (6.2)



Pneumatic Schematic





Logan Hydraulic Soft Start™ Start-Up Kits for SAE Series PTO / SPF Series PTO

The Logan Soft Start Hydraulic Start-Up Kits are designed to simplify Logan clutch installation and to ensure reliable and accurate engagement of the Logan PTO. The auto pilot Soft Start valve is factory preset to 2 to 3 sec. longer ramp up times are field adjustable.



IMPORTANT!

Test ramp-up time at final installation prior to operation. Different ramp-up time may result in clutch failure. Adjust ramp-up time if necessary.

Manifolds: Logan offers a solenoid activated, normally closed, 3-way directional control valve. Valves are available in 12 or 24 volt DC.

An ATEX option is available.

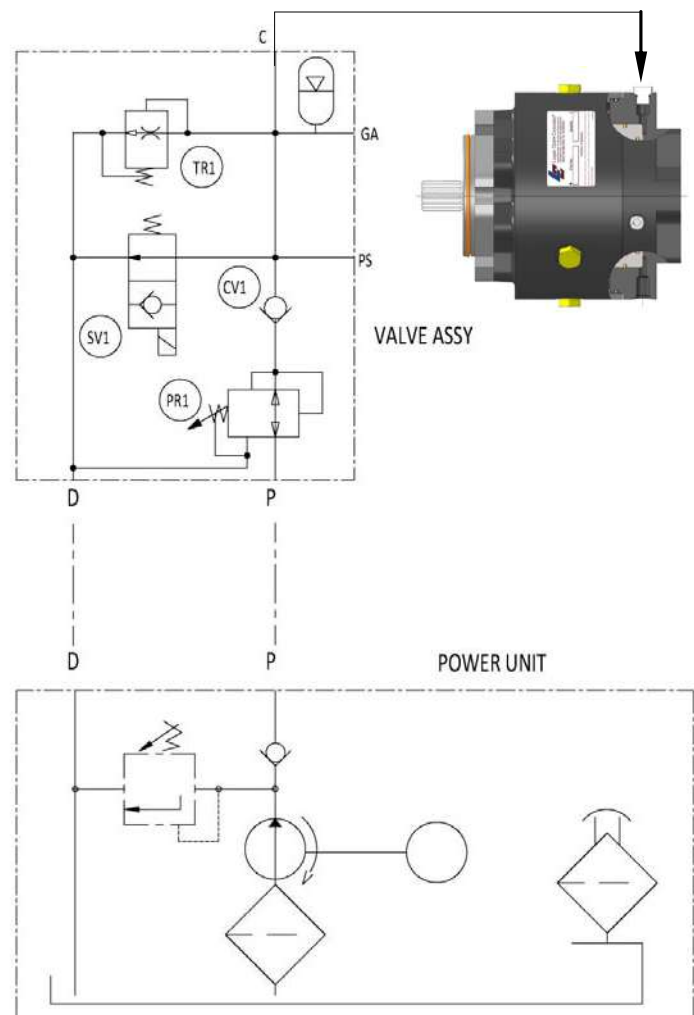
Hydraulic Power-Pack Unit with Soft Start™ Feature

For vehicles that are not equipped with an air or fluid source, Logan offer a hydraulic D.C. motor power pack. Units run when clutch is engaged and shut off when full actuation pressure is reached. Units are preset to re-energize when fluid pressure falls to a minimum pressure and relieve (through a pressure relief valve) when pressure exceeds a maximum clutch pressure. A local and remote provision for actuation is supplied. Operated by a 12 VDC or 24 VDC power supply, the power pack should be mounted away from the engine exhaust manifold, dirt and heat.



IMPORTANT!

Always refer to Logan Clutch Hydraulic D.C. Motor Power Pack Installation, Operation and Maintenance Manual for operating specifications, installation, maintenance and troubleshooting.



* Power pack models may vary slightly depending upon actual model ordered and updates.

Operation: Logan Direct Drive SAE PTO's require a 2 position, 3-way hydraulic valve with a system flow rate of 2 GPM (7.5 liters) to ensure proper response time during clutch actuation; (if the solenoid is not activated, fluid will not pass through the valve).

A pressure switch must be installed in the inlet line to ensure that a minimum pressure (see chart) is available prior to clutch engagement. Pressures exceeding the maximum clutch pressure will cause back plate deflection and premature clutch failure.

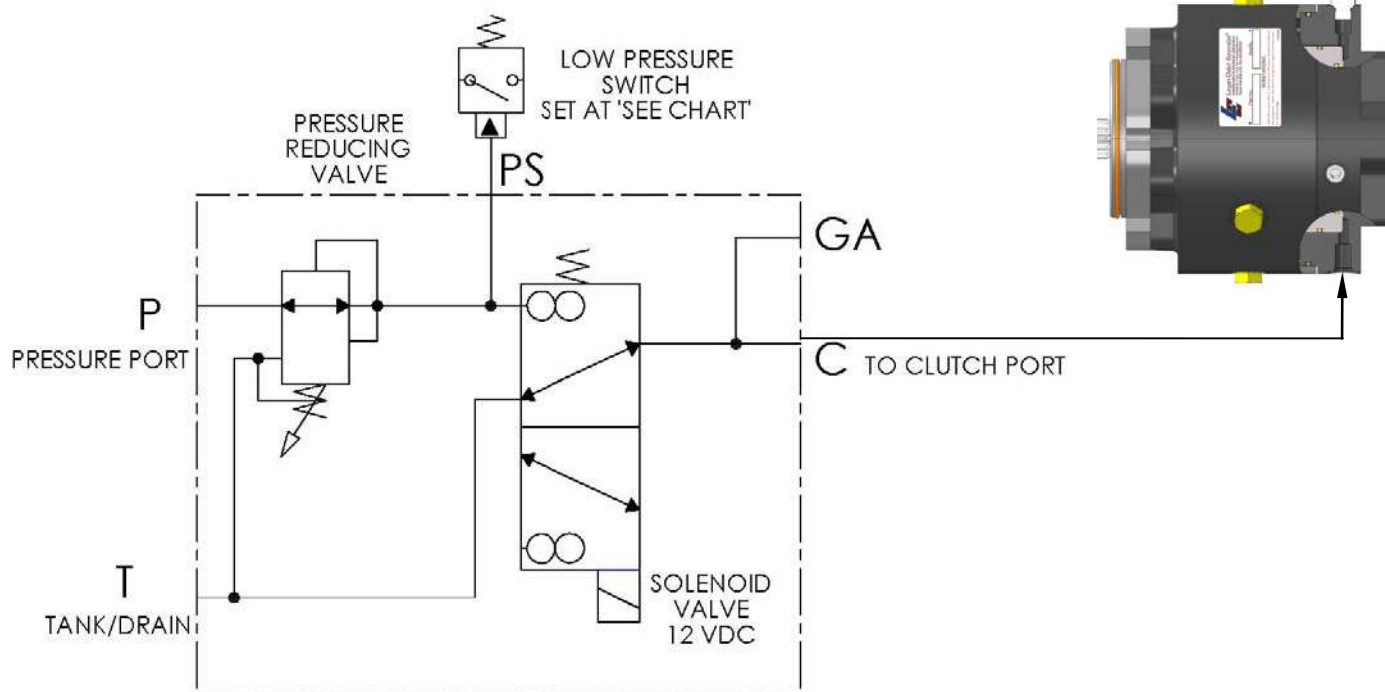
Logan Direct Drive SAE PTO's require an unrestricted port back to tank. It is not recommended to install a filter element on this return line, as any back-pressure exceeding 5 PSI (0.3 bar) will result in poor disengagement and excessive heat and wear.

A 10-micron filter element must also be installed in the supply line before the valve, to minimize excessive dirt, oil and moisture.

If a hydraulic source is not readily available on your equipment, Logan suggests using an hydraulic pump capable of producing 2 GPM .

Maximum Clutch Actuation Option PSI (bar)	Recommended Low Pressure Switch Setting PSI (bar)	Minimum Input Pressure PSI (bar)
200 (13.8)	150 (10.3)	300 (20.5)
320 (22)	250 (17.2)	500 (38.0)

*Hydraulic Schematic



* Schematic depicts typical actuation option.

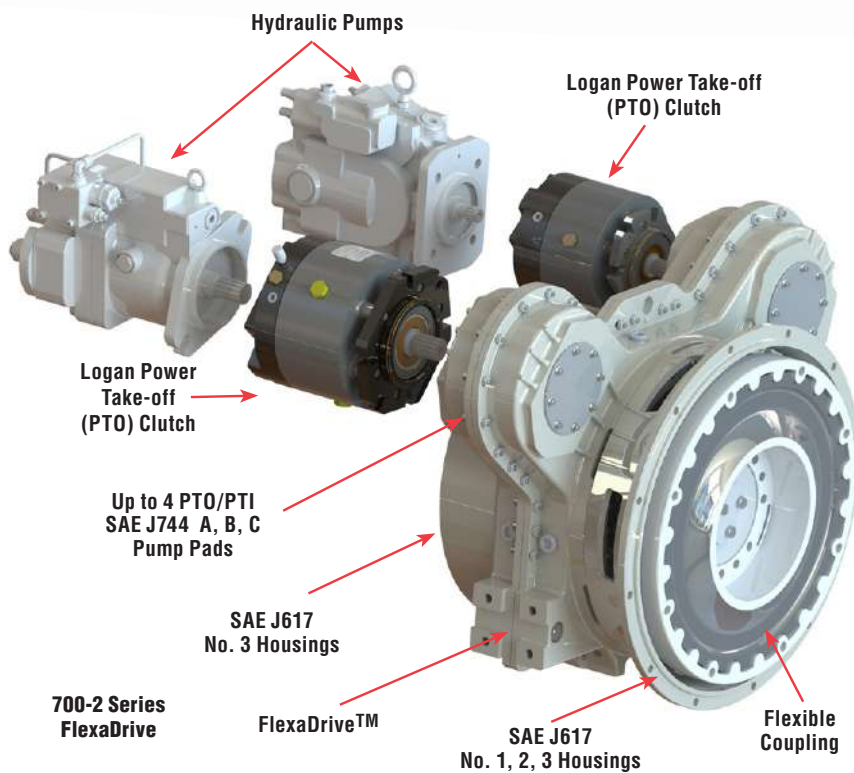
On-Demand Power for Hydraulic Pumps – Right from your Engine Powered Genset



Deere 4045T Genset

Logan FlexaDrives and Front of Engine PTO Clutches offer on-demand power for diesel genset powered, multiple pump drive systems.

- Reduces fuel consumption and CO₂ emissions by engaging drives and pumps only when required
- Reduced ambient noise through intermittent use of pumps and equipment – ideal for workboats and Yachts
- Extends life of drive system and components



Front of Engine PTO

Logan System Advantages:

- Reduces fuel consumption and CO₂ emissions by engaging drives and pumps only when required
- Better engine starts: Reduces horsepower draw and cranking power required during machine start-up by disconnecting the hydraulic system from the engine
- Reduced ambient noise through intermittent use of pumps and equipment
- Easily disconnect hydraulic pumps from the engine (via clutch) to troubleshoot hydraulics while Engine remains in operation
- Cooler running hydraulic systems: Heat is generated whenever oil dumps from high to low pressure without producing work.
- Disconnecting the PTO Clutch reduces the destructive effects of heat – lowering maintenance costs and hydraulic oil service requirements
- Extends the life of drive systems and components
- Standard PTO clutches available in B, B-B, C, C-C, and other popular sizes



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