Logan SAE Direct Drive Power Take-Off (PTO) Clutches

US Patent # 8,839,933

- Industrial
- Marine
- On-Highway
- Construction
- Agriculture
- Mining
- Rail
- Oil & Gas
- Lawn & Turf Equipment

Logan Clutch Corporation®
manufacturers of clutches and brake products

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 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

Standard units available in B, B-B, C, C-C, D, F and bore with key

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

Custom spline, bore and keyways available

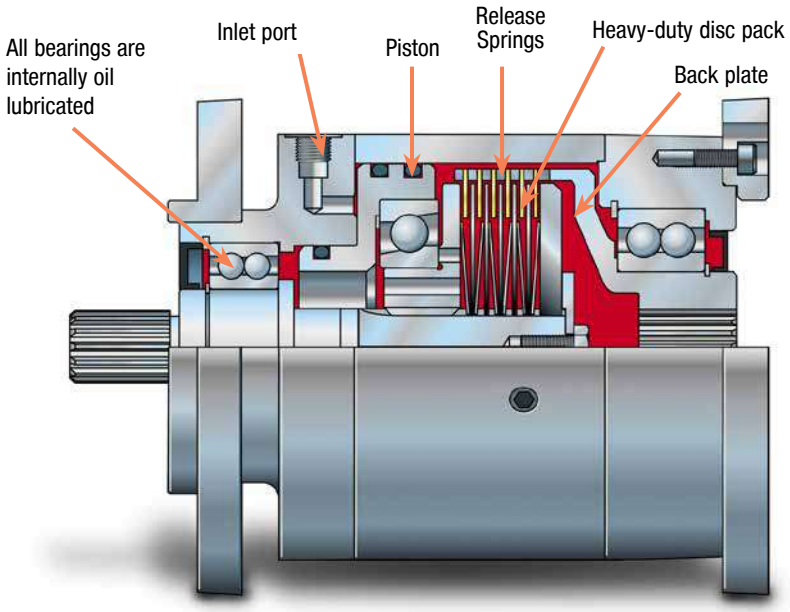
Advantages

- Reduces fuel consumption and CO2 Emissions by engaging drives and pumps only when required
- Quicker Starts: Lowers 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
- 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

Modified standards available for specific design requirements

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

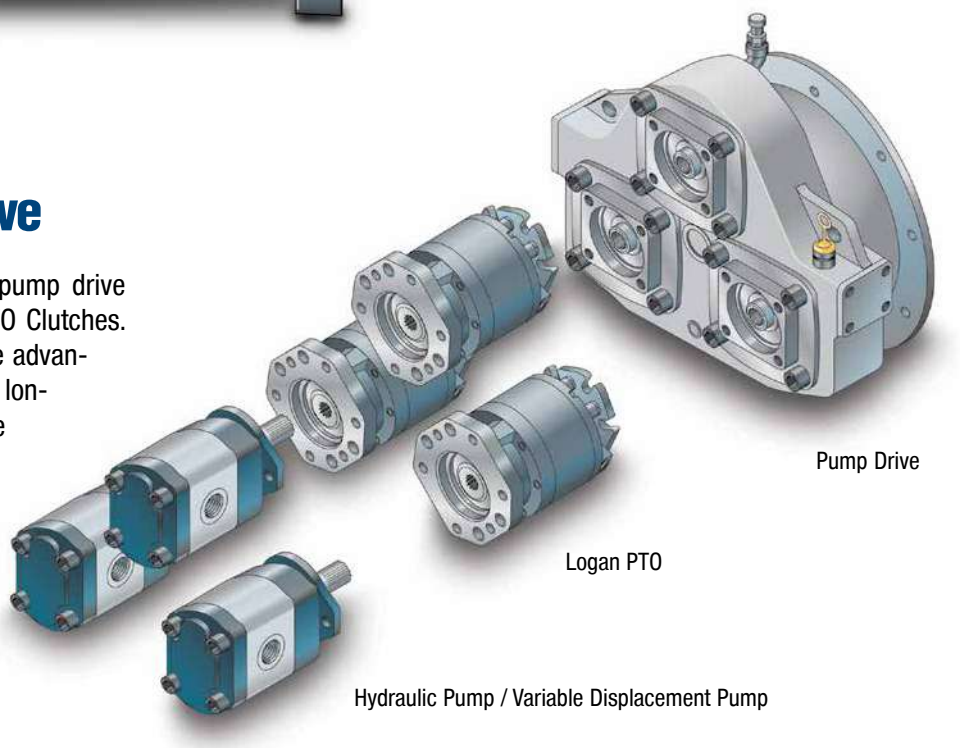
Logan PTO clutches are Hydraulically or Pneumatically actuated. Pressurizing the cylinder, forces the piston to clamp and lock the friction and separator discs. When pressure is removed, release springs separate the separator discs and maintain a running clearance between separator and friction discs.



- 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

Typical Application: Multi-Station Pump Drive

Applications such as this multi-station pump drive with bell housing are ideal for Logan PTO Clutches. OEM and aftermarket designers can take advantage of energy savings and component longevity by utilizing Logan PTOs to drive auxiliary attachments only when required.



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 Power Take-off (PTO) Clutch – Series Description

SAE Series PTO – Direct Drive

PTO Clutch for in-line shaft or pump pad mounted applications

Features:

- Air or Fluid Actuated
- Self-Adjusting Disc Pack
- Smooth Engagement-Disengagement
- Ideal for In-line shaft or pump pad applications
- SAE or ISO Mounting Flanges
- Available in B, C, D, D/E, E and F splines, plus bore and key configurations
- Shaft adapters available for common Dana and DIN style flanges

PTO Clutch for in-line shaft or SAE/ISO pad mounted applications

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

PTO Clutch with integral flexible coupling

See Logan SPF catalog for dimensional data

FPTO Series PTO – Direct Drive Short Axial Length

PTO Clutch with through bolt design for low profile compact applications

Features:

- Air or Fluid Actuated
- Self-Adjusting Disc Pack
- Smooth Engagement-Disengagement
- SAE 2-Bolt or 4-bolt B Mount
- SAE 4-bolt C Mount
- 12 & 24 Volt DC Control valve system integrates with existing transmission pressure
- 30 psi./2 bar sealed input housing

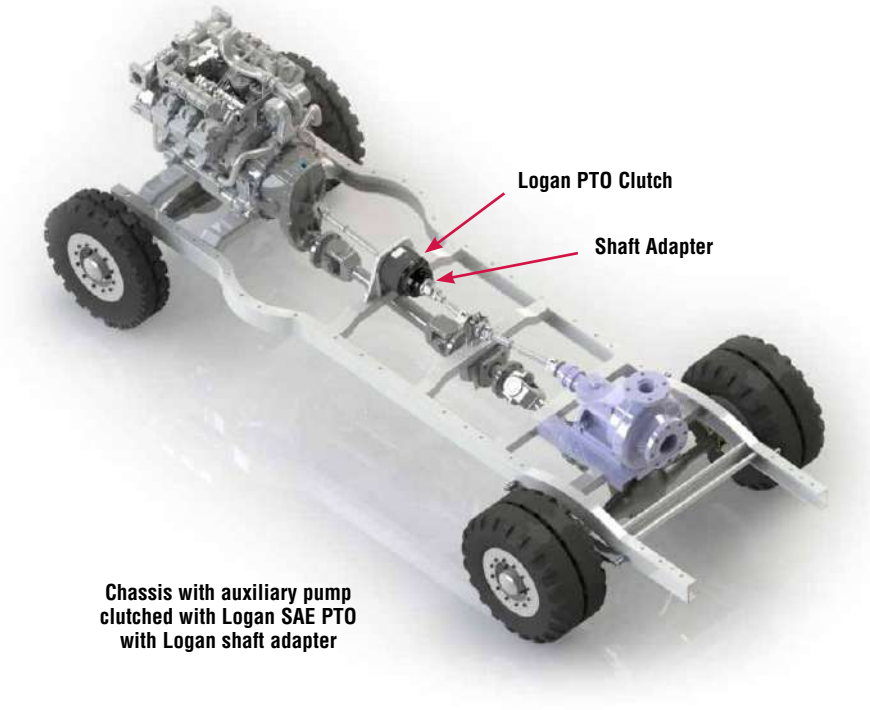
PTO Clutch with 2-bolt or 4-bolt mount for low profile, compact applications

See Logan FPTO catalog for dimensional data

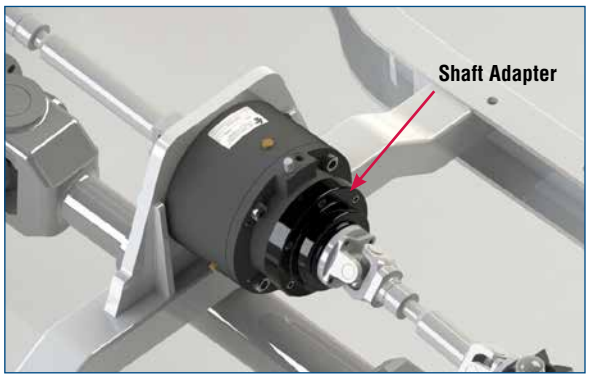
Logan PTO Clutches – Mobile Equipment

Logan PTO Clutches When Used With Shaft Adapter Option

Logan PTO's provide live engine power for auxiliary pump drives - through a separate PTO drive shaft. The Logan direct drive PTO clutch bolts directly to the OEM's Cardan Shaft (using a Logan shaft adapter), providing on-off engagement of auxiliary drives or pumps in this example.



Chassis with auxiliary pump clutched with Logan SAE PTO with Logan shaft adapter



Logan 600 Series with shaft adapter

Shaft adapter options available for 300, 600, 1000, 1200 and 1500 Series PTO's

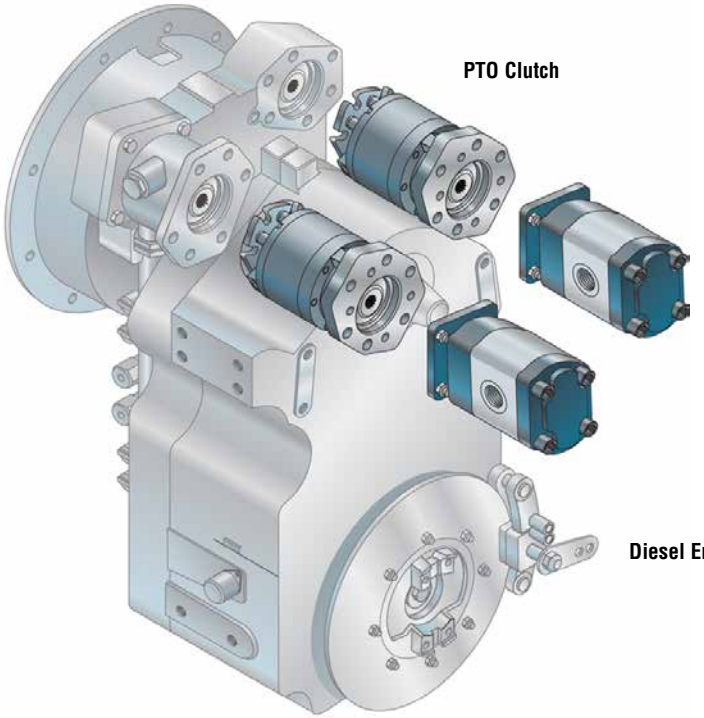
Shaft adapter option (shown left)

Mobile Equipment

Logan PTO's are designed to mount between the power take-off pad of the engine and attachment or pump drive

Logan Advantages:

- PTO is powered directly from the crankshaft, behind the engine's flywheel.
- Does not require extended front frames, modified bumpers, brackets, radiators and drive couplings associated with front PTO's.
- Eliminates exposure of the PTO and pump to front-end collision damage.

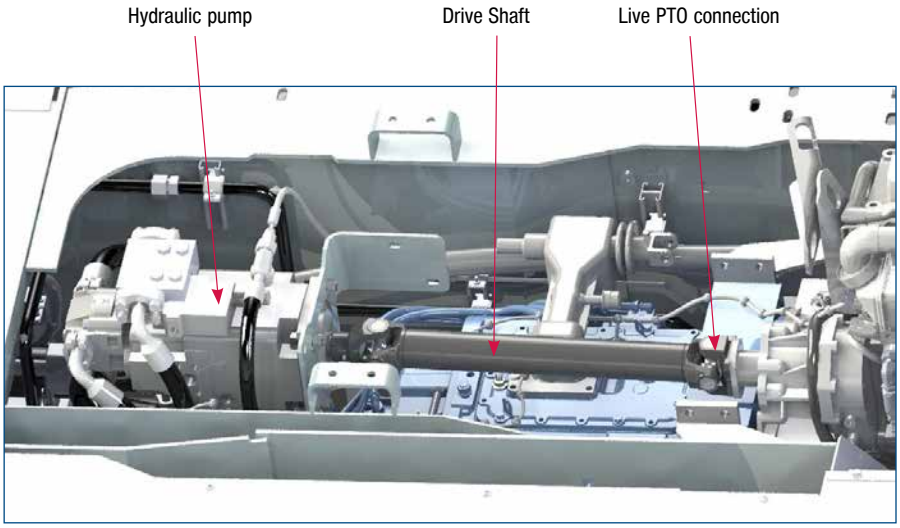


OEM Manufacturer of Construction Equipment Works Together with Logan Application Team

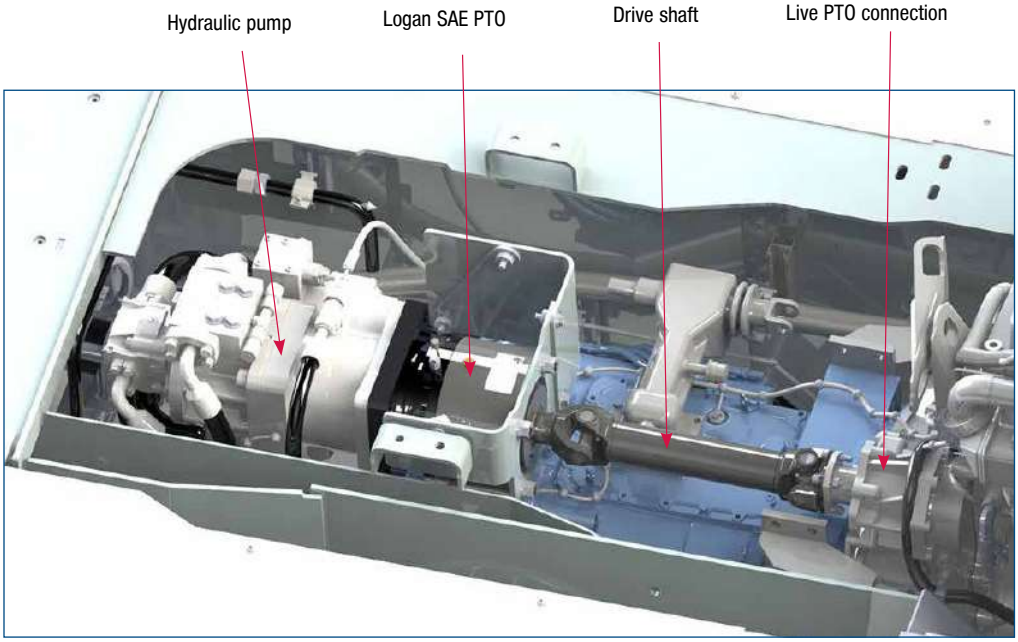
THE CHALLENGE: BEFORE

OEM contacts Logan to solve system issues which are causing hydraulic pump failure

Most OEM manufacturers of mobile equipment use hydraulic piston pumps to control machine movements and attachments. In many cases these hydraulic piston pumps are driven remotely from the engine's auxiliary PTO drive via a slip yoke shaft. Machine Operators must be able to turn these pumps on and off when the vehicle is driven from job site to job site - in order to prevent over speeding the pump when the engine is running faster than the pumps normal hydraulic work speed. There is also the potential for all the pumps to engage at once, which would cause the input torque rating to be above the engine specifications causing hydraulic system and pump failure. In this situation, customers were going beyond the limits of the machine and pump specs – the OEM had to do something quickly -they contacted Logan.



Before: Customer experienced pump over-speeding between job sites, causing system failure, warranty claims and downtime



After: Logan SAE PTO installed between the hydraulic pump and drive-shaft, enabling connect-disconnect, on demand power to the OEM's piston pump

THE SOLUTION: AFTER

Logan adapts off the shelf SAE PTO Clutch to meet specific OEM customer need

In most cases the pumps are already defined by the customer, which requires Logan to fit with small envelopes, sandwiching the Logan Clutch in between the pump and engine. After considering all of the options with Logan application engineers, the OEM selected an SAE PTO 1200 Series Clutch. In less than a week, extensive lab and field tests were conducted. Results were positive. The OEM quickly created space to sandwich the Logan Clutch between the driveline and the piston pump – thereby eliminating the possibility of over speeding the pumps. This solution enabled the OEM to keep its customer base happy by eliminating unnecessary machine downtime.

Logan Power Take-Off (PTO) Clutches - Oil & Gas Applications

On-highway oil and gas vehicle

In this Oil & Gas vehicle application, the Logan SAE 600 series Direct Drive PTO is mounted on a typical 2-pad live PTO pump pad, sandwiched between a CAT 3412 Diesel Engine and an Allison 8900 Series Transmission. The Logan 600 series Direct Drive Power Take-off (PTO) clutch will connect or disconnect the single and tandem pumps mounted to the live PTO pump pad. The pumps are used only on the job site, and remain disconnected (via the Logan PTO) when the vehicle is idle and not in use, or when driving to and from the job site. This option to clutch-in and clutch out the pumps minimizes wear and tear on the pumps, reduces unnecessary fuel consumption, and the chances of over speeding the pumps (since they are disconnected from the drivetrain) when the vehicle is at highway speeds during transport.

Close up of (4) Logan 600 series PTO's used to connect and disconnect the single and tandem pumps between jobs, or during on-highway trips to prevent pumps from overspeeding.

Logan SAE 600 series Direct Drive PTO's Mounted to a live PTO wing drive, sandwiched between a CAT 3412 Engine and an Allison 8900 Series Transmission. Logan PTO's are used to disconnect single and tandem pumps on an oil and gas vehicles.

Logan PTO's For On-Highway or Off-Road Transmissions

Logan PTO's are used in a variety of Mobile, 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

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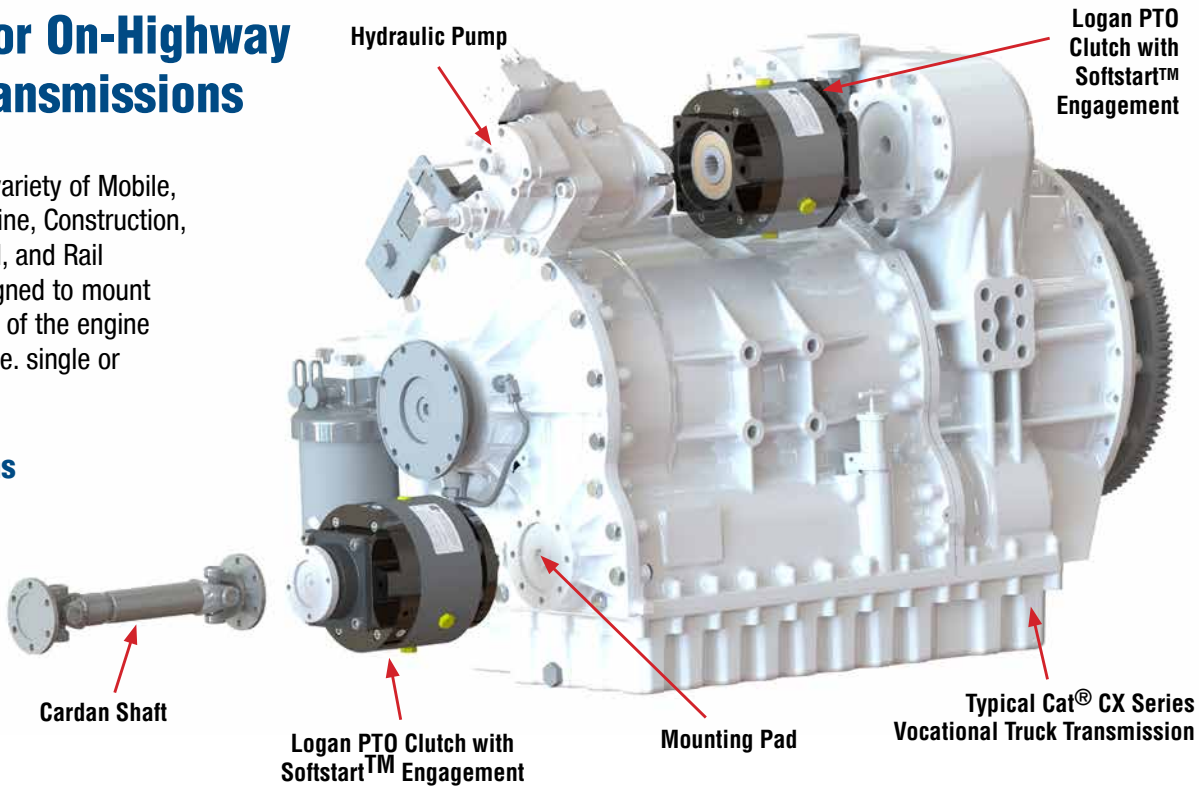


Logan Direct Drive Power Take-Off (PTO) Clutches for Main and Auxiliary Engines

Logan PTO's for Industrial and Marine Gearboxes

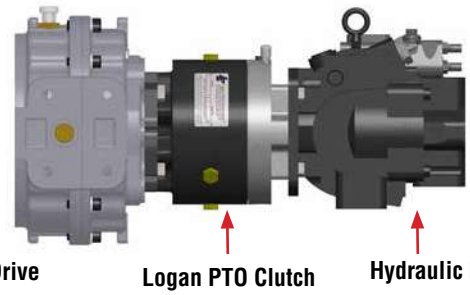
Lufkin Gearbox with Logan 600 Series Direct Drive PTO (600 lb. ft. / 1335 Nm) @ 200 psi. / 13.6 bar. The Logan PTO is positioned between a pump and gearbox, enabling power on demand for cold starts, and connect-disconnect applications.

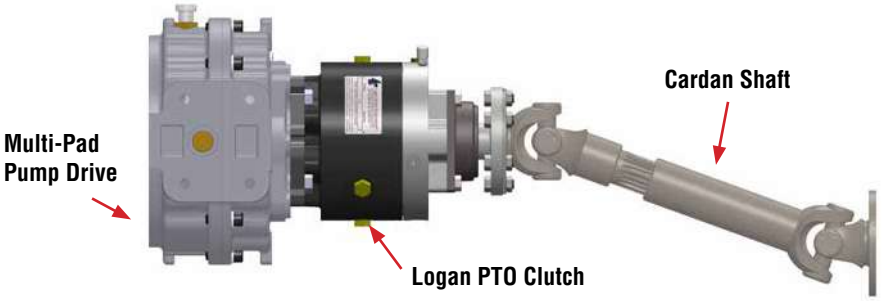
Logan direct drive PTO's are effective and reliable solutions for applications where hydraulic pumps are used in on-demand or intermittent situations. This Lufkin gearbox with live SAE C pad incorporates a Logan 600 series PTO to connect, and disconnect a hydraulic pump which is used to power nets, reels, hoists, anchors, and bow thrusters on a fishing vessel. The ability to engage on-demand limits the amount of fuel and emissions required to power the pump, which is used in application specific tasks. The Logan softstart™ feature guarantees smooth engagement at RPM's consistent with the new tier requirements for marine, mobile and industrial engines.

Power Take-off Clutch Mounting Options

Direct Connection to Power Source

The PTO clutch is directly mounted to the power source via the SAE standard flange. The auxiliary pump mounts directly to the output of clutch, utilizing the same SAE standard flange.

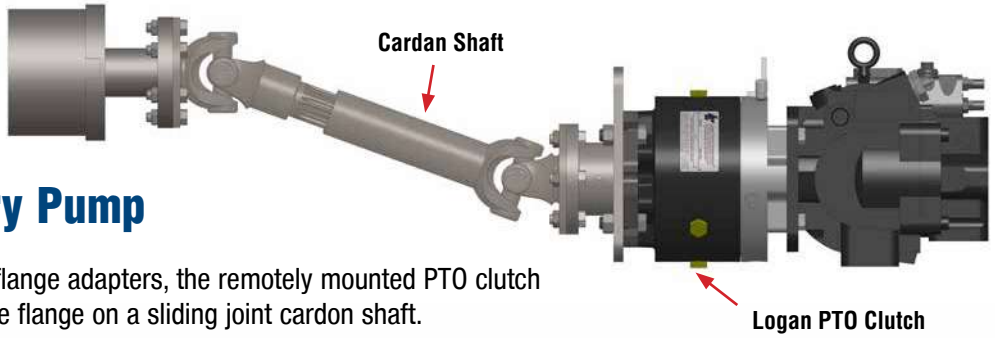




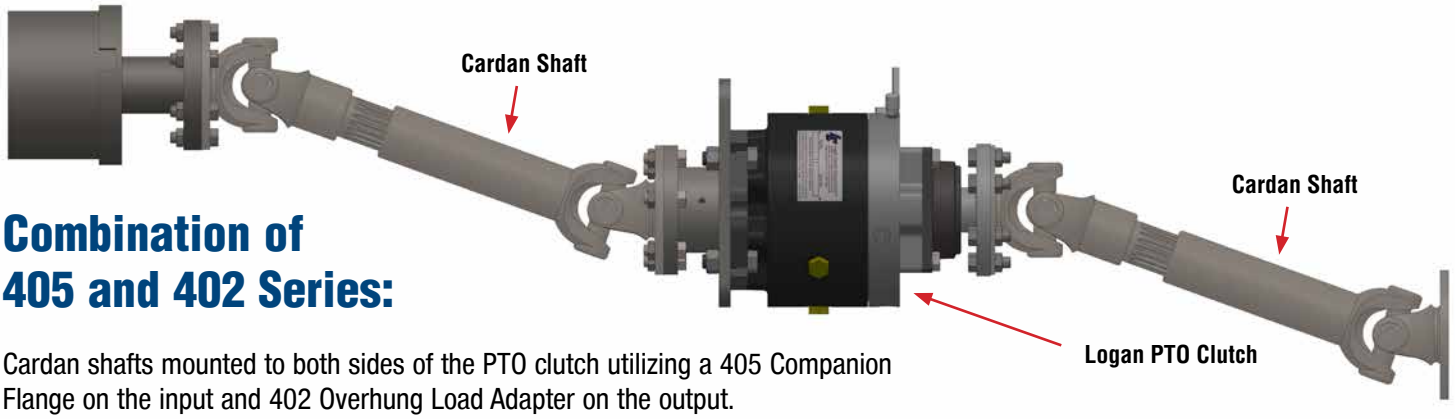
402 Series: Remote Mounting of Auxiliary Pump

Overhung load adapter mounts to the output of the PTO Clutch assembly and allows for moderate side load induced by a cardon shaft.

405 Series: Remote Mounting of Consecutive PTO Clutch and Auxiliary Pump



Utilizing the Logan 405 Series companion flange adapters, the remotely mounted PTO clutch input interfaces with a standard Spicer-type flange on a sliding joint cardon shaft.

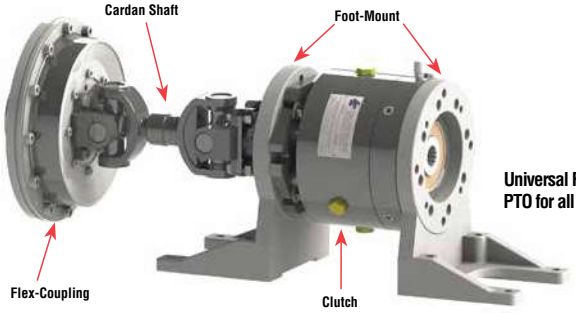


Combination of 405 and 402 Series:

Cardan shafts mounted to both sides of the PTO clutch utilizing a 405 Companion Flange on the input and 402 Overhung Load Adapter on the output.

Universal Front of Engine PTO for All Engines

Logan Universal Front of Engine PTO's incorporate an integral flexible coupling, clutch cardan shaft and bracket arrangement. Works with most new and legacy engines and can be installed with fewer alignment procedures.



Logan PTO Clutches - Marine Applications

Logan FPTO - PTO for low profile, compact applications

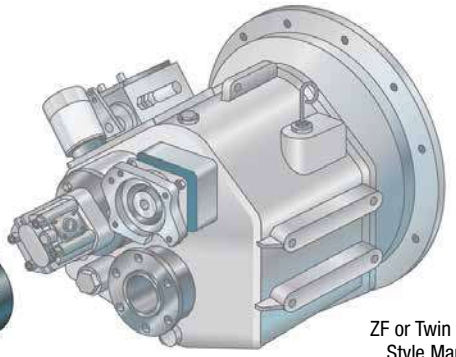
The low profile, compact, Logan PTO design is suitable for workboats fishing boats and pleasure craft.

Features:

- SAE 2 or 4-bolt B mount
- SAE 4-bolt C mount
- 12 or 24 Volt DC control valve system integrates with existing transmission pressure

Advantages:

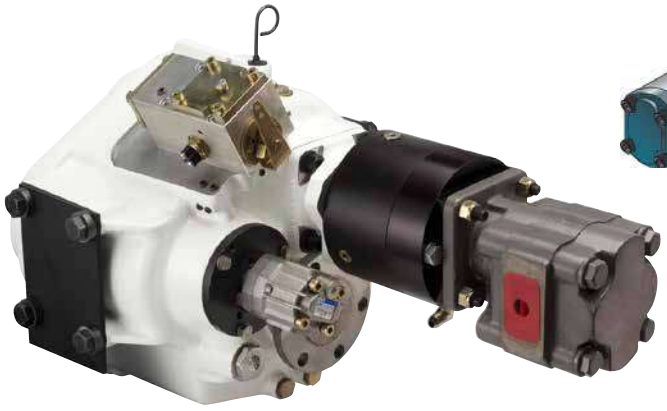
- During Maneuvering – which requires reduction of main engine speed, the Logan PTO is used as a separate power source for bow and stern thrusters.
- Directly connects to a pump drive, which powers winches, reels, hoists, deck pressure washers and alternators.



ZF or Twin Disc® Style Marine Transmission

Logan PTO

Hydraulic Pump



View of ZF 280 transmission equipped with a Logan SBB-2000 clutch mounted between the live PTO and 30 gallon per minute pump.

Commercial fishing boat on San Francisco Bay

Logan Front Mount PTO's and Flywheel Mounted PTO's for Marine Diesel Engines and Gensets

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

Flywheel PTO Clutch for Diesel Engine

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

Logan PTO Clutch Selection Procedure

Simplified Selection Procedure for Pump on Pad Configurations:

Determine pump face and shaft requirements. If mounting pad is identical, determine method of actuation, and select clutch from page 13 specifications.

Clutch Selection Procedures for Applications with Drive Shaft Input or Output, and Pumps not Conforming to SAE J744 (i.e. Fire Fighting Pumps)

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

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

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.

Clutch/Brake Torque Capacity (Tc or Tb) =

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

T= Tc x SF or T=Tb x 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

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

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

$$\text{kW} = \frac{\text{T(Nm.) x RPM}}{9550} \qquad \text{Torque (Nm.)} = \frac{\text{kW x 9550}}{\text{RPM}}$$

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

Logan SAE PTO Part Numbering System

S C C - 6 1 0 0 D - 0 1

1 2 3 4 5 6 7 8

1 STYLE

S SAE PTO

4 RATED TORQUE (ft.lbs.)

200	300	400	600	1000	1200	1500
2	3	4	6	10	12	15

RATED TORQUE (Nm)

271	407	542	814	1356	1627	2034

2 INPUT FLANGE SIZE

B
C
D
E
F

6 CLUTCH SIZE • STANDARD – INPUT SIZE MALE

	200	300	400	600	1000	1200	1500
00		DRY 'B' SPLINE	DRY 'C' SPLINE	DRY 'C' SPLINE	DRY 'D' SPLINE	DRY 'F' SPLINE	DRY 'F' SPLINE
01	WET 'B' SPLINE	WET 'B' SPLINE	WET 'C' SPLINE	WET 'C' SPLINE	WET 'D' SPLINE	WET 'F' SPLINE	WET 'F' SPLINE
02		DRY 'B-B' SPLINE	DRY 'C-C' SPLINE	DRY 'C-C' SPLINE	DRY 'D' SHAFT	DRY 'E' SHAFT	
03	WET 'B-B' SPLINE	WET 'B-B' SPLINE	WET 'C-C' SPLINE	WET 'C-C' SPLINE	WET 'D' SHAFT	WET 'E' SHAFT	
04		DRY 'B' SHAFT		DRY 'C' SHAFT			DRY 2 7/16 w/ 5/8
05		WET 'B' SHAFT		WET 'C' SHAFT			
06		DRY 'B-B' SHAFT		DRY 'C-C' SHAFT			
07		WET 'B-B' SHAFT		WET 'C-C' SHAFT			
08		DRY 'C' SHAFT					
09		WET 'C' SHAFT					

3 OUTPUT FLANGE SIZE

A
B
C
D
E
F

5 ACTUATION PRESSURE PSI/BAR

1	120/8.3
2	200/13.8
3	320/22.1

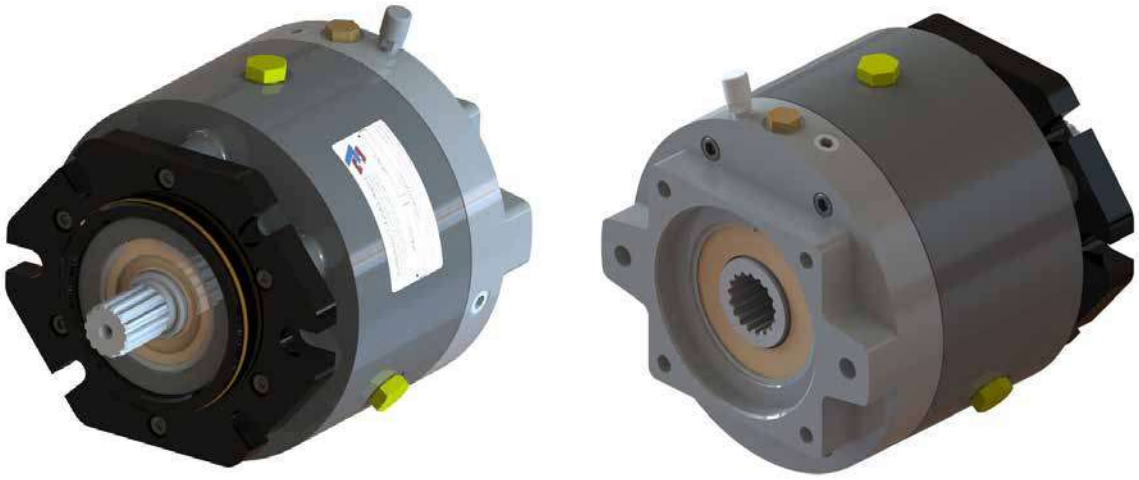
7 DUAL ACTUATION - 120 and 320 PSI

DESIGNATION APPLIES TO RATED TORQUE MODELS 1000, 1200 AND 1500 SERIES

8 CLUTCH SIZE • STANDARD – OUTPUT SIZE FEMALE

	200	300	400	600	1000	1200	1500
01	'B' SPLINE	'B' SPLINE	'C' SPLINE	'C' SPLINE	'D' SPLINE	'F' SPLINE	'F' SPLINE
02	'B-B' SPLINE	'B-B' SPLINE	'C-C' SPLINE	'C-C' SPLINE	'D' BORE/KEY	'D' SPLINE	'D' SPLINE
03	'B' BORE/KEY	'B' BORE/KEY	'C' BORE/KEY	'C' BORE/KEY	SPLINE 27T 16/32 DP	SPLINE 33T 16/32 DP	'D' BORE 1.75 w/ 7/16 KEY
04	'B-B' BORE/KEY	'B-B' BORE/KEY	SPLINE 21T 16/32 DP	'C-C' BORE/KEY	SPLINE 33T 16/32 DP		BORE 2-7/16 w/ 5/8 KEY
05				'D' SPLINE			SPLINE 27T 16/32 DP
06				SPLINE 21T 16/32 DP			SPLINE 33T 16/32 DP
07				SPLINE 23T 16/32 DP			

SAE Series Power Take-Off (PTO) Specifications



PTO Clutch for in-line shaft or SAE/ISO pad mounted applications

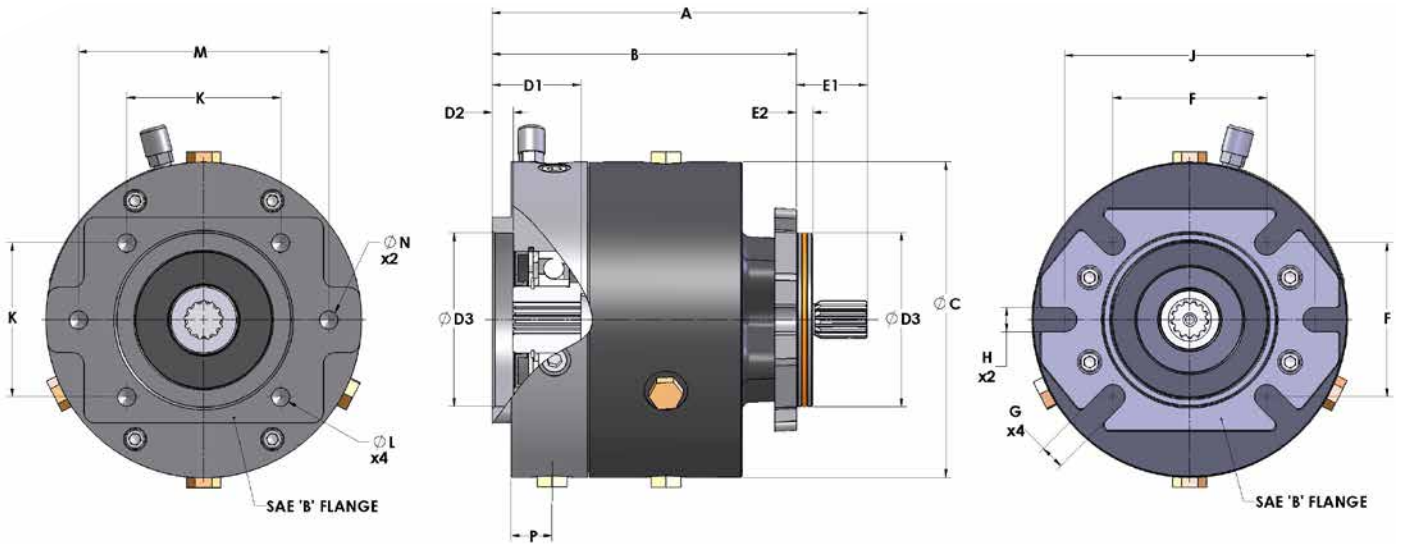
SAE Series PTO – Direct Drive

PTO Clutch for in-line shaft or pump pad mounted applications

Features:

- Air or Fluid Actuated
- Self-Adjusting Disc Pack
- Smooth Engagement-Disengagement
- Ideal for In-line shaft or pump pad applications
- SAE or ISO Mounting Flanges
- Available in B, C, D, E and F splines, plus bore and key configurations
- Shaft adapters available for common Dana and DIN style flanges

SAE PTO 300 Specifications



Mounting dimensions conforming to SAE J744

DIMENSIONAL DATA*

DIMENSIONS IN INCHES																	
8.61	6.99	7.25	2.04	0.49	4.002	1.62	0.37	3.998	3.534	0.56	0.56	5.75	3.534	1/2-13 UNC	5.75	1/2-13 UNC	0.94
A	**B**	**C**	**D1**	**D2**	**D3**	**E1**	**E2**	**E3**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**P**
218.7	177.5	184.2	51.8	12.4	101.7	41.1	9.4	101.5	89.8	14.2	14.2	146.1	89.8	1/2-13 UNC	146.1	1/2-13 UNC	23.9
DIMENSIONS IN MILLIMETERS																	

PTO 300 Actual Static Torque****		3100 Series	3200 Series	3300 Series
Standard Units	Lbs.-Ft.	510	510	510
	PSI (MAX.)	**120**	**200**	**320**
Metric Units	**Bar (MAX.)**	**8.3**	**13.8**	**22.1**
	Nm	692	692	692

PTO 300 Series Input Shaft Option***
SAE 'B' Spline 13T 16/32 DP
SAE 'B-B Spline 15T 16/32 DP
SAE 'B' Ø .875 x 1/4 Sq. Key
SAE 'B-B' Ø 1.000 x 1/4 Sq. Key
SAE 'C' Spline 14T 12/24 DP

PTO 300 Series Output (Pump) Shaft Option***
SAE 'B' Spline 13T 16/32 DP
SAE 'B-B Spline 15T 16/32 DP
SAE 'B' Ø .875 x 1/4 Sq. Key
SAE 'B-B' Ø 1.000 x 1/4 Sq. Key

PTO 300 Specifications

	U.S.	S.I.
*** Rated Torque (Maximum)**	**300 ft.lbs.**	**407 Nm**
Maximum HP	170 HP	255 kW
*Maximum RPM	3000 RPM	3000 RPM
Rotation	Bi-rotation	Bi-rotation
** Maximum Actuation Pressure	120, 200 or 320 PSI	8.3, 13.8 or 22.1 bar
Min/Max Case Pressure at Input w/Optional High Pressure Seals	7/50 PSI	0.5/3.4 bar
Min. Flow Rate Required (Actuation)	1.5 GPM	5.6 liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Max. Back Pressure to Tank (Actuation)	7 PSI	0.5 bar
Maximum Actuation Fluid Temperature	180° F	82° C
Displacement: 3100 Series (New/Worn)	2.66/4.88 in3	43.6/80.0 cm3
3200 Series (New/Worn)	1.71/3.14 in3	28.0/51.5 cm3
3300 Series (New/Worn)	1.00/1.84 in3	16.4/30.2 cm3
Weight (Approx.)	28 lbs.	13 kg

NOTES:

* Standard configuration. Modified standards available.

** Logan SAE PTO 300 Series clutches are available in three (3) different actuation pressures. Refer to part number to determine model configuration.

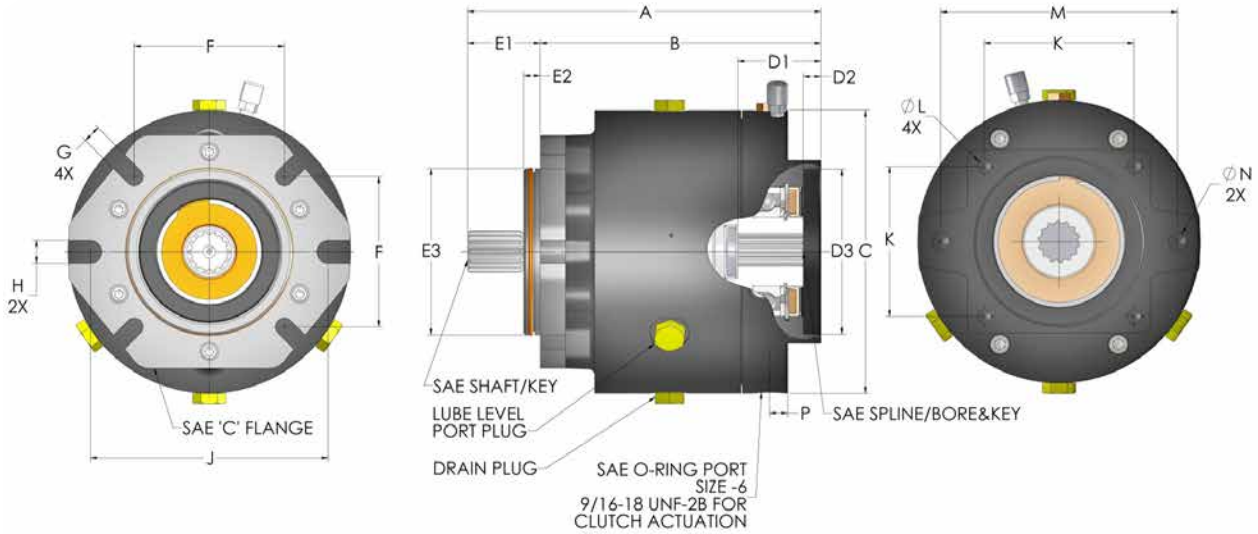
*** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.

**** Torque ratings based on using ATF fluid as a lubricant. Refer to Logan IOM Manual for approved lubricants.

Disclaimer:

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

SAE PTO 600 Specifications



Mounting dimensions conforming to SAE J744

DIMENSIONAL DATA*

DIMENSIONS IN INCHES																
10.62	8.44	8.5	2.5	0.53	5.002	2.18	0.5	4.998	4.511	0.54	0.69	7.15	4.508	1/2-13UNC	7.125	5/8-11UNC	0.55
A	**B**	**C**	**D1**	**D2**	**D3**	**E1**	**E2**	**E3**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**P**
269.8	214.4	215.9	63.5	13.5	127.1	55.4	12.7	126.9	114.6	13.7	17.5		114.5	1/2-13UNC	181	5/8-11UNC	14
DIMENSIONS IN MILLIMETERS																	

PTO 600 Actual Static Torque****		6100 Series	6200 Series	6300 Series
Standard Units	Lbs.-Ft.	912	985	985
	PSI (MAX.)	**120**	**200**	**320**
Metric Units	**Bar (MAX.)**	**8.3**	**13.8**	**22.1**
	Nm	1237	1336	1336

PTO 600 Series Input Shaft Option***
SAE 'C' Spline 14T 12/24 DP
SAE 'C-C' Spline 17T 12/24 DP
SAE 'C' Ø 1.250 x 5/16 Sq. Key
SAE 'C-C' Ø 1.500 x 3/8 Sq. Key

PTO 600 Series Output (Pump) Shaft Option***
SAE 'C' Spline 14T 12/24 DP
SAE 'C-C' Spline 17T 12/24 DP
SAE 'C' Ø 1.250 x 5/16 Sq. Key
SAE 'C-C' Ø 1.500 x 3/8 Sq. Key
Spline 21T 16/32 DP
Spline 23T 16/32 DP
SAE 'D' 13T 8/16 DP

PTO 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, 200 or 320 PSI	8.3, 13.8 or 22.1bar
Min/Max Case Pressure at Input w/Optional High Pressure Seals	7/50 PSI	0.5/3.4 bar
Min. Flow Rate Required (Actuation)	1.5 GPM	5.7 liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Max. Back Pressure to Tank (Actuation)	7 PSI	0.5 bar
Maximum Actuation Fluid Temperature	180° F	82° C
Displacement: 6100 Series (New/Worn)	3.3/5.1 in3	54/83.5 cm3
6200 Series (New/Worn)	2.4/3.6 in3	39.3/59 cm3
6300 Series (New/Worn)	1.5/2.3 in3	24.5/37.7 cm3
Weight (Approx.)	52 lbs.	24 kg

NOTES:

* Standard configuration. Modified standards available. Soft Start feature may be required for engagement above machine idle RPM.

** Logan SAE PTO 600 Series clutches are available in three (3)different actuation pressures. Refer to part number to determine model configuration.

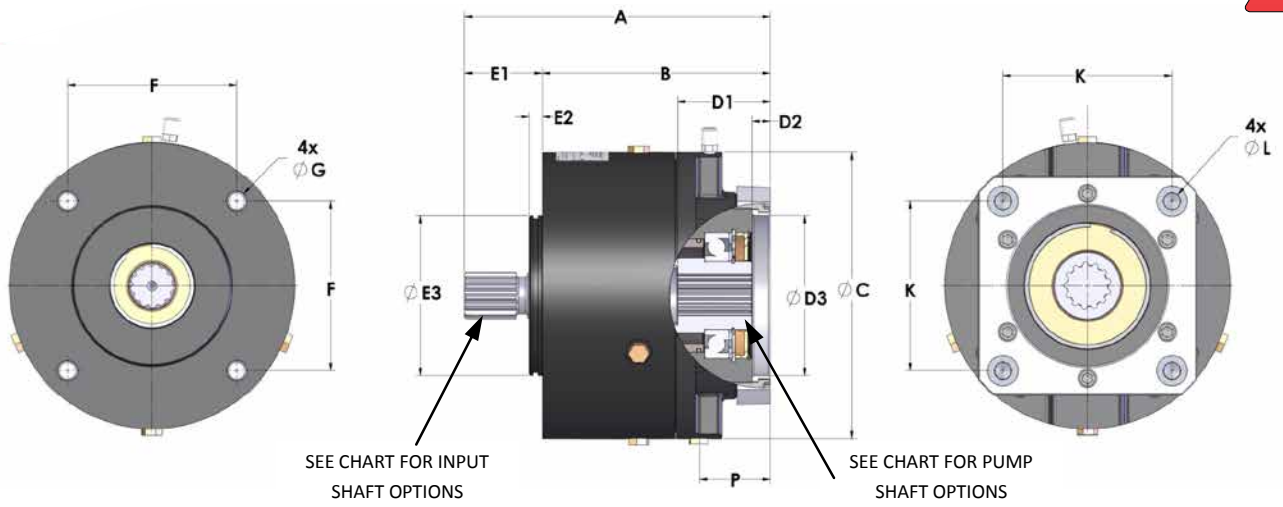
*** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.

**** Torque ratings based on using ATF fluid as a lubricant. Refer to Logan IOM Manual for approved lubricants.

Disclaimer:

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

SAE PTO 1000 Specifications



Mounting dimensions conforming to SAE J744

DIMENSIONAL DATA*

DIMENSIONS IN INCHES																
12.11	9.19	10.75	3.48	0.69	6.002	2.93	0.5	5.998	6.364	0.78	6.364	3/4-10 UNC	2.69	1/2-13UNC	7.125	5/8-11UNC	0.55
A	**B**	**C**	**D1**	**D2**	**D3**	**E1**	**E2**	**E3**	**F**	**G**	**K**	**L**	**P**	**L**	**M**	**N**	**P**
307.6	233.4	273.1	88.4	17.5	152.5	74.4	12.7	152.3	161.6	19.8	161.6	3/4-10 UNC	68.3	1/2-13UNC	181	5/8-11UNC	14
DIMENSIONS IN MILLIMETERS																	

PTO 1000 Actual Static Torque****		10100 Series	10200 Series	10300 Series
Standard Units	Lbs.-Ft.	1595	1595	1595
	PSI (MAX.)	**120**	**200**	**320**
Metric Units	**Bar (MAX.)**	**8.3**	**13.8**	**22.1**
	Nm	2163	2163	2163

PTO 1000 Series Input Shaft Option***
SAE 'D'&'E' Spline 13T 8/16 DP
SAE 'D' Ø 1.750 x 7/16 Sq. Key

PTO 1000 Series Output (Pump) Shaft Option***
SAE 'D'&'E' Spline 13T 8/16 DP
SAE 'D' Ø 1.750 x 7/16 Sq. Key
Spline 27T 16/32 DP
Spline 33T 16/32 DP

PTO 1000 Specifications

	U.S.	S.I.
*** Rated Torque (Maximum)**	**1000 ft.lbs.**	**1356 Nm**
Maximum HP	570 HP	512 kW
*Maximum RPM	3000 RPM	3000 RPM
Rotation	Bi-rotation	Bi-rotation
** Maximum Actuation Pressure	120, 200 or 320 PSI	8.3, 13.8, 22.1 bar
Max Case Pressure at Input	7 PSI	0.5 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Maximum Back Pressure to Tank (Actuation)	4 PSI	0.3 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
Displacement: 10100 Series (New/Worn)	5.7/8.0 in3	93.4/131.1 cm3
10200 Series (New/Worn)	3.1/4.5 in3	50.8/73.8 cm3
10300 Series (New/Worn)	2.0/3.0 in3	32.8/49.2 cm3
Weight (Approx.)	84 Lbs.	38 Kg

NOTES:

* Standard configuration. Modified standards available. Soft Start feature may be required for engagement above machine idle RPM.

** Logan SAE PTO 1000 Series clutches are available in three (3)different actuation pressures. Refer to part number to determine model configuration.

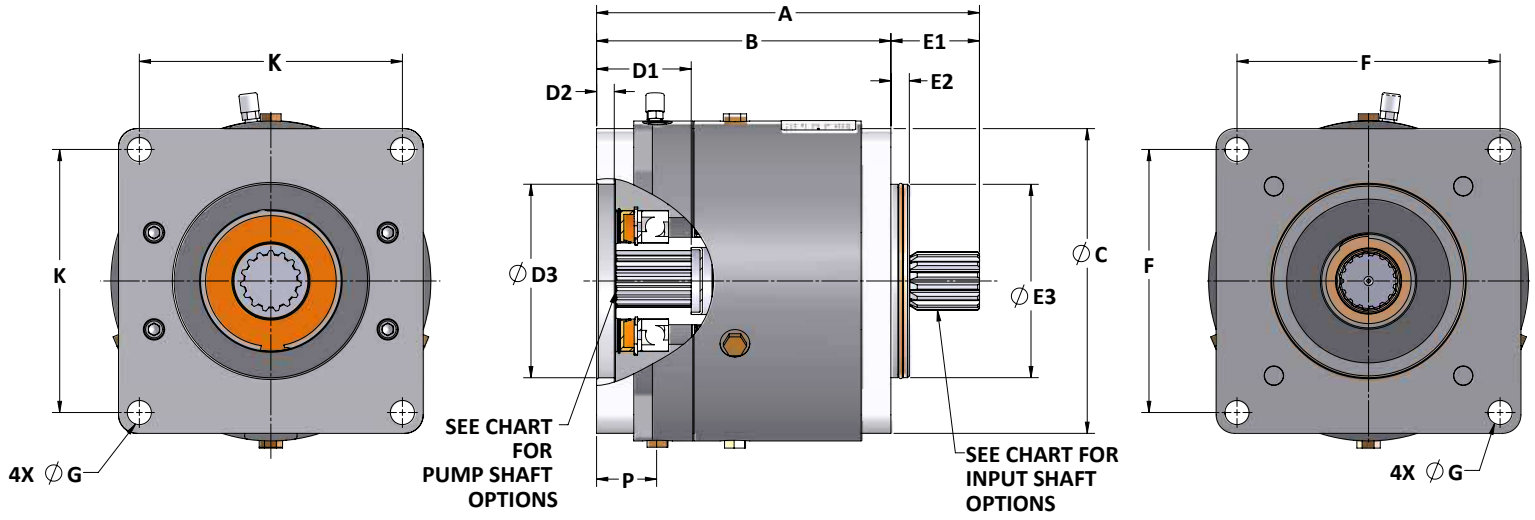
*** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.

**** Torque ratings based on using ATF fluid as a lubricant. Refer to Logan IOM Manual for approved lubricants.

Disclaimer:

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

SAE PTO 1200 Specifications



Mounting dimensions conforming to SAE J744

DIMENSIONAL DATA*

DIMENSIONS IN INCHES												
12.86	9.89	10.75	3.18	0.64	6.500	2.97	0.62	6.498	8.840	0.81	8.840	2.05
A	**B**	**ØC**	**D1**	**D2**	**ØD3**	**E1**	**E2**	**ØE3**	**F**	**ØG**	**K**	**P**
326.6	251.2	273.1	80.8	16.3	165.1	75.4	15.7	165.0	224.5	20.6	224.5	52.0
DIMENSIONS IN MILLIMETERS												

PTO 1200 Actual Static Torque****		12100 Series	12200 Series	12300 Series
Standard Units	Lbs.-Ft.	1710	1710	1710
	PSI (MAX.)	**120**	**200**	**320**
Metric Units	**Bar (MAX.)**	**8.3**	**13.8**	**22.1**
	Nm	2319	2319	2319

PTO 1200 Series Input Shaft Option***
SAE 'D' & 'E' Ø1.750 x 7/16 Sq. Key
SAE 'D' & 'E' Spline 13T 8/16 DP
SAE 'F' Spline 15T 8/16 DP

PTO 1200 Series Output (Pump) Shaft Option***
SAE 'D' & 'E' Spline 13T 8/16 DP
SAE 'F' Spline 15T 8/16 DP
Spline 33T 16/32 DP

PTO 1200 Specifications

	U.S.	S.I.
*** Rated Torque (Maximum)**	**1200 ft.lbs.**	**1627 Nm**
Maximum HP	686 HP	512 kW
*Maximum RPM Under Load	3000 RPM	3000 RPM
*Recommended Engagement Speed	Idle	Idle
Rotation	Bi-rotation	Bi-rotation
** Maximum Actuation Pressure	120, 200 or 320 PSI	8.3, 13.8, 22.1 bar
Max Case Pressure at Input	7 PSI	0.5 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Maximum Back Pressure to Tank (Actuation)	4 PSI	0.3 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
Displacement : 12100 Series (New/Worn)	6.6/9.5 in^3	108.1/155.7 cm^3
12200 Series (New/Worn)	3.4/5.0 in^3	55.7/82.0 cm^3
12300 Series (New/Worn)	2.2/3.2 in^3	36.0/52.4 cm^3
Weight (Approx.)	97 Lbs.	44 Kg

NOTES:

* Standard configuration. Modified standards available. Soft Start feature may be required for engagement above machine idle RPM.

** Logan SAE PTO 1200 Series clutches are available in three (3)different actuation pressures. Refer to part number to determine model configuration.

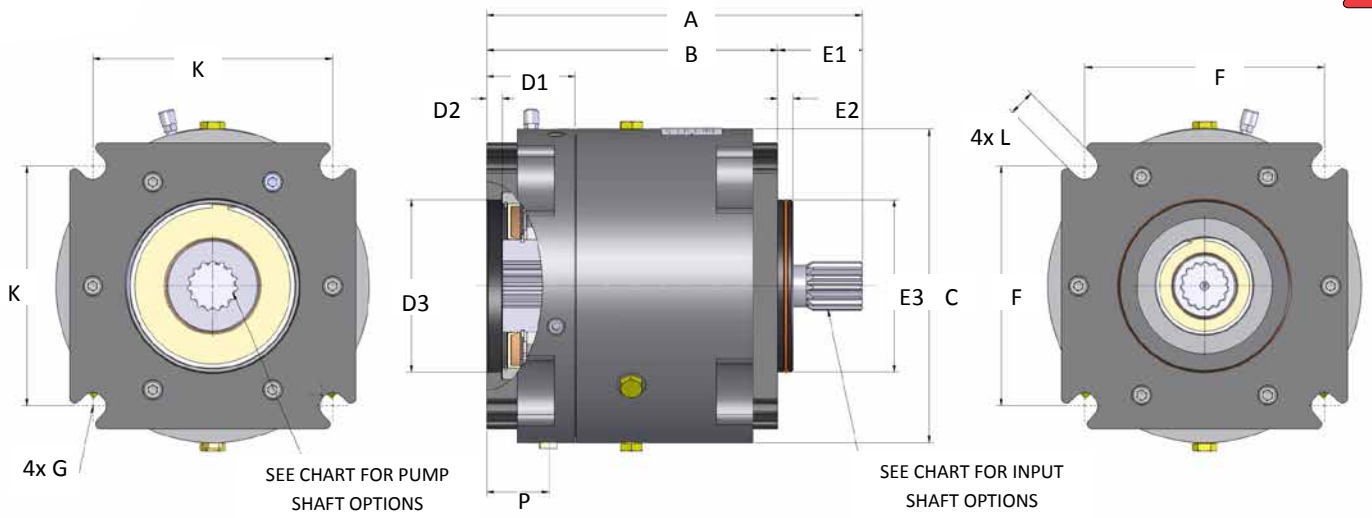
*** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.

**** Torque ratings based on using ATF fluid as a lubricant. Refer to Logan IOM Manual for approved lubricants.

Disclaimer:

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

SAE PTO 1500 Specifications



Mounting dimensions conforming to SAE J744

DIMENSIONAL DATA*

DIMENSIONS IN INCHES													
15.27	11.83	12.75	3.5	0.63	7.002	3.44	0.63	6.998	9.745	1.06	9.745	1.06	2.5
A	**B**	**C**	**D1**	**D2**	**D3**	**E1**	**E2**	**E3**	**F**	**G**	**K**	**L**	**P**
387.9	300.5	323.9	88.9	16	177.9	87.4	16	177.7	247.5	26.9	247.5	26.9	63.5
DIMENSIONS IN MILLIMETERS													

PTO 1500 Actual Static Torque****		15200 Series	1550D Series	
Standard Units	Lbs.-Ft.	2564	2600	3000
	PSI (MAX.)	**200**	**120**	**320**
Metric Units	**Bar (MAX.)**	**13.8**	**8.3**	**22.1**
	Nm	3477	3525	4068

PTO 1500 Series Input Shaft Option***
SAE 'F' Spline 15T 8/16 DP
Ø 2.437 x 5/8 Sq. Key

PTO 1500 Series Output (Pump) Shaft Option***
SAE 'D' & 'E' Spline 13T 8/16 DP
SAE 'D' Ø 1.750 x 7/16 Sq. Key
2-7/16 w/ 5/8 Key
Spline 27T 16/32 DP
SAE 'F' Spline 15T 8/16 DP
Spline 33T 16/32 DP

PTO 1500 Specifications

	U.S.	S.I.
*** Rated Torque (Maximum)**	**1500 ft.lbs.**	**2034 Nm**
Maximum HP	570 HP	425 kW
*Maximum RPM	2000 RPM	2000 RPM
Rotation	Bi-rotation	Bi-rotation
** Maximum Actuation Pressure	120, 200 or 320 PSI	8.3, 13.8, 22.1 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Maximum Back Pressure to Tank (Actuation)	7 PSI	0.5 Bar
Maximum Fluid Temperature	210° F	99° C
Displacement: 15200 Series 200 PSI (New/Worn)	4.9/6.5 in3	80/106 cm3
1550D Series 120 PSI (New/Worn)	8.5/11.4 in3	139/187 cm3
1550D Series 320 PSI (New/Worn)	3.6/4.8 in3	59/79 cm3
12300 Series (New/Worn)	2.2/3.2 in3	36.0/52.4 cm3
Weight (Approx.)	82 Lbs.	37 Kg

NOTES:

* Standard configuration. Modified standards available. Soft start feature may be required for engagement above machine idle RPM.

** Logan SAE PTO 1500 Series clutches are available in three (3)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. Refer to Logan IOM Manual for approved lubricants.

Disclaimer:

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

FPTO Series Power Take-Off (PTO) Specifications

PTO Clutch with 2-bolt or 4-bolt mount for low profile, compact applications

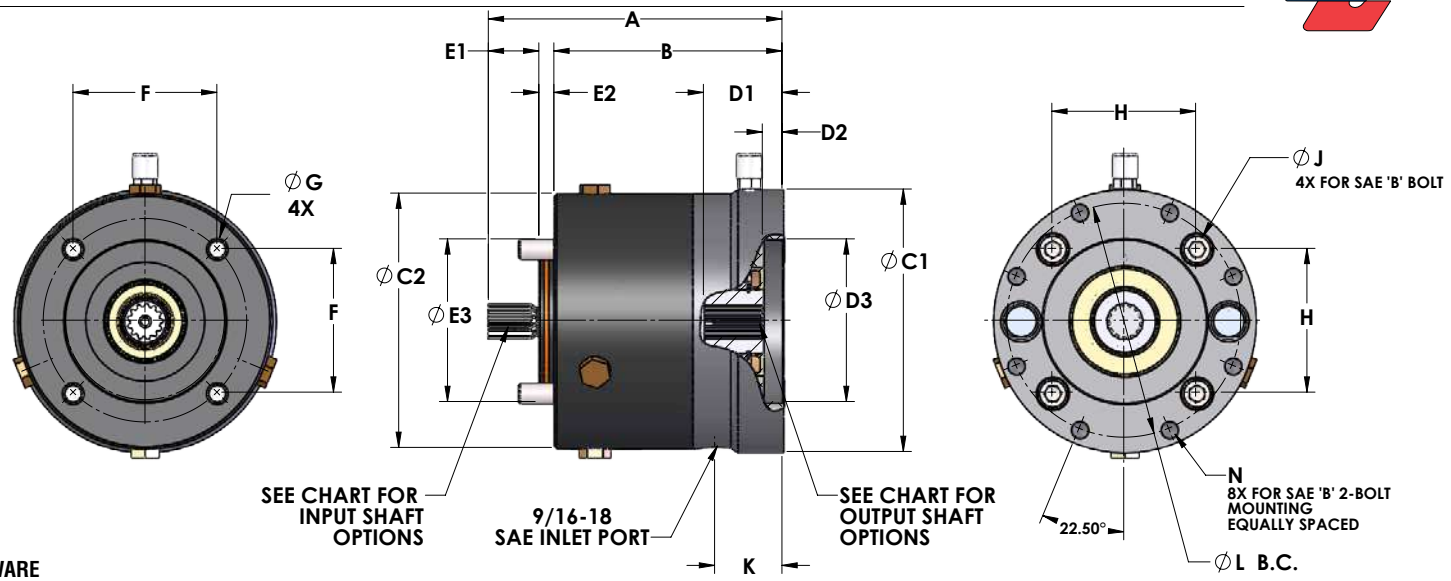
FPTO Series PTO – Direct Drive Short Axial Length

PTO Clutch with through bolt design for low profile compact applications

Features:

- Air or Fluid Actuated
- Self-Adjusting Disc Pack
- Smooth Engagement-Disengagement
- SAE 2-Bolt or 4-bolt B Mount
- SAE 4-bolt C Mount
- 12 & 24 Volt DC Control valve system integrates with existing transmission pressure
- 30 psi./2 bar sealed input housing

SAE PTO 200 Series SAE 'B' Mount 2 or 4-Bolt Specifications



HARDWARE
4 Bolt or 2 Bolt Mounting Configuration. Output side only. Specifications according to SAE J744. Complete dimensions may be obtained from ANSI B93.6-1972. Standard design for wet input.

DIMENSIONAL DATA*

DIMENSIONS IN INCHES																	
4 Bolt B	4 or 2 Bolt B	7.22	5.61	6.45	6.25	1.93	0.49	4.002	1.25	0.37	3.996	3.536	0.53	3.536	0.53	1.66	5.75	1/2-13 UNC
INPUT	**OUTPUT**	**A**	**B**	**ØC1**	**ØC2**	**D1**	**D2**	**ØD3**	**E1**	**E2**	**ØE3**	**F**	**ØG**	**H**	**ØJ**	**K**	**ØL**	**N**
4 Bolt B	4 or 2 Bolt B	183.4	142.5	163.8	158.8	49	12.4	101.65	31.8	9.4	101.5	89.8	13.5	89.8	13.5	42.1	146.1	1/2-13 UNC
DIMENSIONS IN MILLIMETERS																		

PTO 200 Actual Static Torque***		2300 Series
Standard Units	Lbs.-Ft.	350
	PSI (MAX.)	**320**
Metric Units	**Bar (MAX.)**	**22**
	Nm	475

PTO 200 Series Input Shaft Option**
SAE 'B' Spline 13T 16/32 DP
SAE 'B-B' 15T 16/32 DP

PTO 200 Series Output (Pump) Shaft Option**
SAE 'B' Spline 13T 16/32 DP
SAE 'B-B Spline 15T 16/32 DP
SAE 'B' Ø .875 x 1/4 Sq. Key
SAE 'B-B' Ø 1.000 x 1/4 Sq. Key

PTO 200 Specifications

	U.S.	S.I.
*** Rated Torque (Maximum)**	**200 ft.lbs.**	**271 Nm**
Maximum HP	100 HP	75 kW
Maximum RPM Under Load	2800 RPM	2800 RPM
Rotation	Bi-rotation	Bi-rotation
Maximum Actuation Pressure	320 PSI	22 bar
Max Case Pressure with High Pressure Seals	50 PSI	3.4 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Maximum Back Pressure to Tank (Actuation)	5 PSI	0.35 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
Weight (Approx.)	17 Lbs.	7.7 kg

NOTES:

* Standard configuration. Modified standards available.

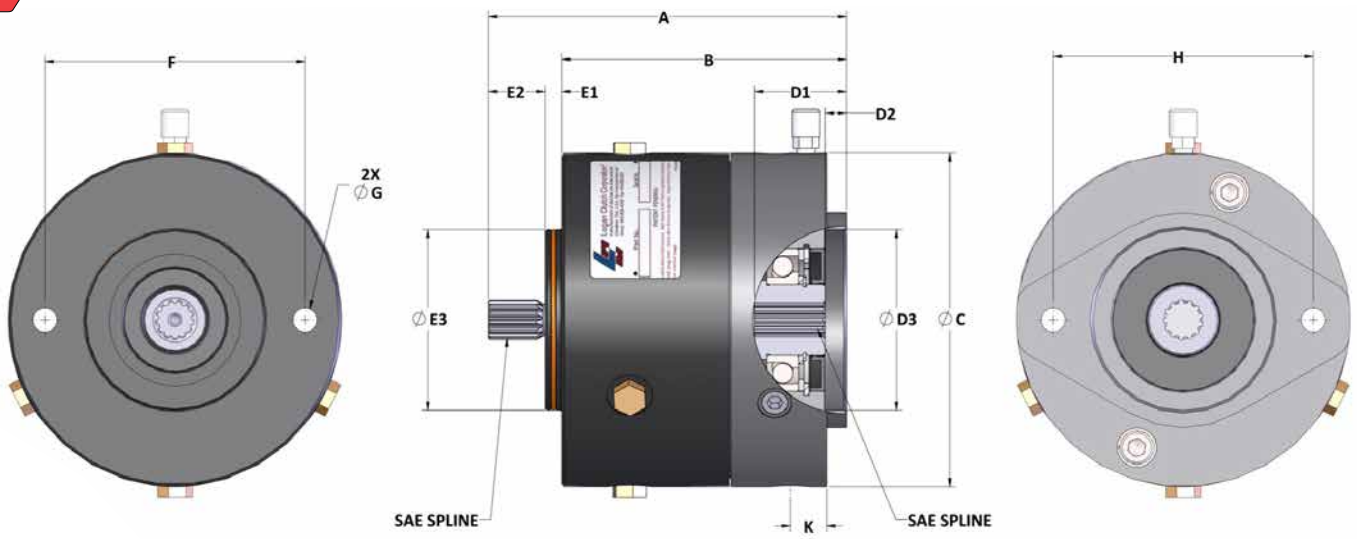
** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.

*** 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.

SAE PTO 305 Series SAE 'B' Mount 2-Bolt Specifications



HARDWARE
2-Bolt Mounting Configuration. Mounting bolts provided.
Specifications According to SAE J744. Complete dimensions may be obtained from ANSI B93, 6-1972.

DIMENSIONAL DATA*

DIMENSIONS IN INCHES												
7.92	6.30	7.38	2.03	0.47	4.002	0.37	1.25	3.998	5.750	0.53	5.750	0.81
A	**B**	**ØC**	**D1**	**D2**	**ØD3**	**E1**	**E2**	**ØE3**	**F**	**ØG**	**H**	**K**
201.2	160	187.45	51.5	11.9	101.65	9.4	31.8	101.5	146.05	13.5	146.05	20.6
DIMENSIONS IN MILLIMETERS												

PTO 305 Actual Static Torque***		3050 Series
Standard Units	Lbs.-Ft.	593
	PSI (MAX.)	**300**
Metric Units	**Bar (MAX.)**	**20**
	Nm	804

PTO 305 Series Input Shaft Option**
SAE 'B' Spline 13T 16/32 DP
SAE 'B-B' 15T 16/32 DP

PTO 305 Series Output (Pump) Shaft Option**
SAE 'B' Spline 13T 16/32 DP
SAE 'B-B Spline 15T 16/32 DP
SAE 'B' Ø .875 x 1/4 Sq. Key
SAE 'B-B' Ø 1.000 x 1/4 Sq. Key

PTO 305 Specifications

	U.S.	S.I.
*** Rated Torque (Maximum)**	**300 ft.lbs.**	**407 Nm**
Maximum HP	170 HP	255 kW
Maximum RPM Under Load	3000 RPM	3000 RPM
Rotation	Bi-rotation	Bi-rotation
Maximum Actuation Pressure	300 PSI	20 bar
Min/Max Case Pressure with High Pressure Seals	7/30 PSI	0.5/2.0 bar
Minimum Flow Rate Required (Actuation)	1.5 GPM	5.6 Liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Maximum Back Pressure to Tank (Actuation)	7 PSI	0.5 Bar
Maximum Actuation Fluid Temperature	180° F	82° C
Displacement: 3050 Series (New/Worn)	1.27/2.0 in^3	20.8/32.8 cm^3
Weight (Approx.)	17 Lbs.	7.7 kg

NOTES:

* Standard configuration. Modified standards available.

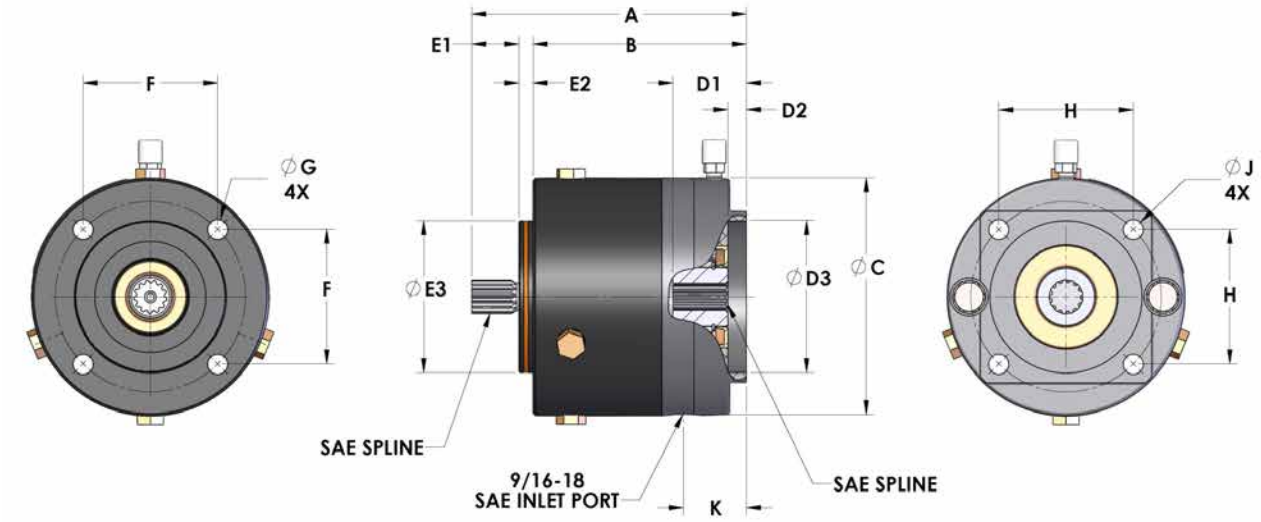
** Contact Logan Clutch for alternative pump shaft options. The output end of the clutch (female spline/bore) is not capable of supporting any side load. Use overhung load adapters.

*** Torque ratings based on using 15W-40 oil 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.

PTO 400 Series SAE 'C' Mount 4-Bolt Specifications



DIMENSIONAL DATA*

DIMENSIONS IN INCHES													
7.22	5.61	6.25	1.93	0.49	4.002	1.25	0.37	3.998	3.534	0.53	3.534	0.53	1.66
A	**B**	**ØC**	**D1**	**D2**	**ØD3**	**E1**	**E2**	**ØE3**	**F**	**ØG**	**H**	**ØJ**	**K**
183.4	142.5	158.8	49	12.3	101.65	31.8	9.4	101.5	89.8	13.5	89.8	13.5	42.1
DIMENSIONS IN MILLIMETERS													

PTO 400 Actual Static Torque****		4100 Series	4300 Series
Standard Units	Lbs.-Ft.	350	471
	PSI (MAX.)	**350**	**300**
Metric Units	**Bar (MAX.)**	**24**	**20**
	Nm	475	638

PTO 400 Series Input Shaft Option***
SAE 'B-B Spline 15T 16/32 DP
SAE 'B-B' Ø 1.000 x 1/4 Sq. Key
SAE 'C' Spline 14T 12/24 DP
SAE 'C' Ø 1.250 x 5/16 Sq. Key
SAE 'C-C' Spline 17T 12/24 DP

PTO 400 Series Output (Pump) Shaft Option***
SAE 'B-B Spline 15T 16/32 DP
SAE 'B-B' Ø 1.000 x 1/4 Sq. Key
SAE 'C' Spline 14T 12/24 DP
SAE 'C' Ø 1.250 x 5/16 Sq. Key
SAE 'C-C' Spline 17T 12/24 DP

PTO 400 Specifications

	U.S.	S.I.
*** Rated Torque (Maximum)**	**400 ft.lbs.**	**542 Nm**
Maximum HP	180 HP	134 kW
*Maximum RPM 4100 Series	2800 RPM	2800 RPM
*Maximum RPM 4300 Series	2300 RPM	2300 RPM
Rotation	Bi-rotation	Bi-rotation
** Maximum Actuation Pressure	120 or 320 PSI	8.3 or 22.1 bar
Min.Flow Rate Required (Actuation)	7/50 PSI	0.5/3.4 bar
Min. Flow Rate Required (Actuation)	1.5 GPM	5.6 liters/min.
Operating Media at Clutch (Oil or Air)	Standard	Standard
Max. Back Pressure to Tank (Actuation)	7 PSI	0.5 bar
Maximum Actuation Fluid Temperature	180° F	82° C
Weight (Approx.)	29 lbs.	13 kg

NOTES:

* Standard configuration. Modified standards available.

** Logan SAE PTO 400 Series clutches are available in three (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.

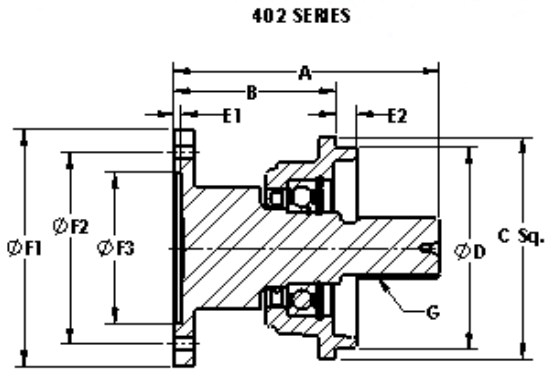
**** Torque ratings based on using ATF fluid as a lubricant. When selecting clutch size, it is recommended to select a clutch with at least 50% more torque than required for factor of safety.

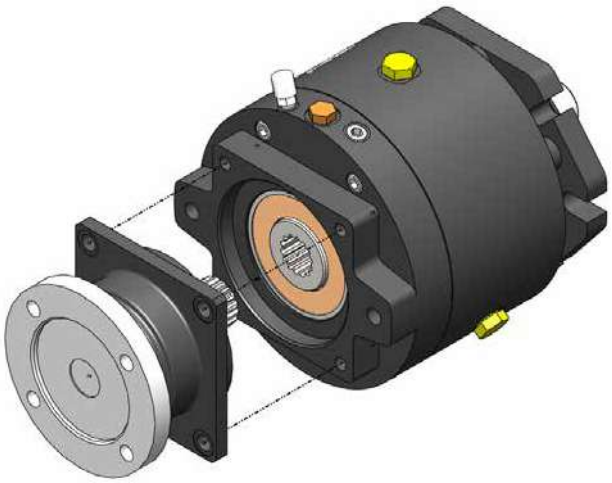
Disclaimer:

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

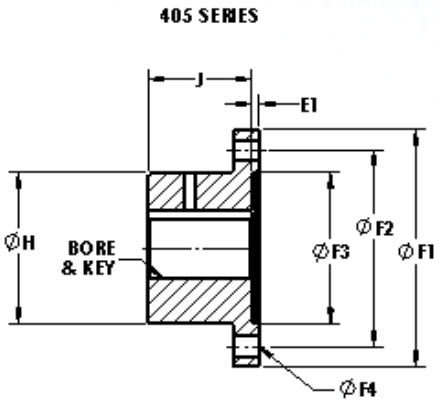
SAE Clutch Drive Shaft Adapters

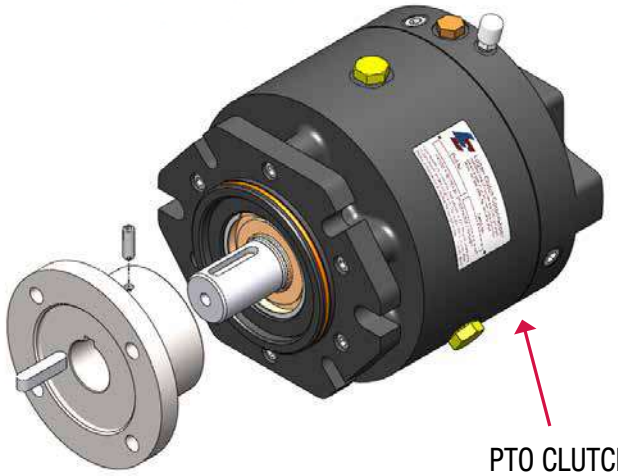
402 Series Adapter





405 Series Adapter

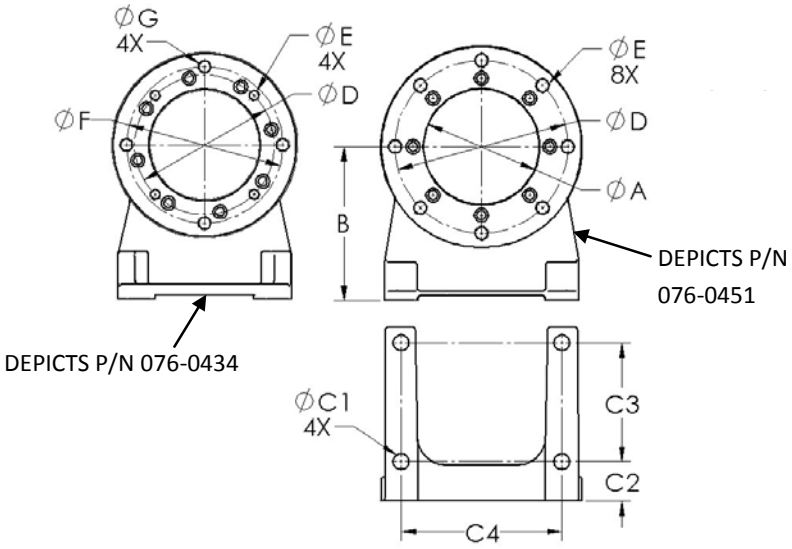


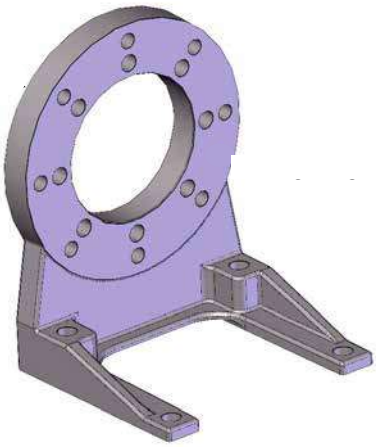


* STANDARD CONFIGURATION SHOWN, OTHERS AVAILABLE

402 SERIES			402 & 405 DRIVE SHAFT FLANGE	405 SERIES	
PART NUMBER	MALE SHAFT	FLANGE		I.D. BORE & KEY DIA. x KEY	PART NUMBER
402-0006	SAE B-B, 15t	2 BOLT B	1350/1410	1.00 x 1/4	405-0006-01
402-0019	SAE C-C, 17t	4 BOLT C	1410	1 1/2 x 3/8	405-0006-02
402-0011	SAE C-C, 17t	4 BOLT C	1410/1480	1 1/2 x 3/8	405-0011-01
402-0010	SAE C-C, 17t	4 BOLT C	1610	1 1/2 x 3/8	405-0010-01
402-0012	SAE D, 13t	4 BOLT D	1610	1 3/4 x 7/16	405-0010-02
402-0004	SAE D, 13t	4 BOLT D	1710	1 3/4 x 7/16	405-0004-01
402-0022	SAE D, 13t	4 BOLT E	1710		
402-0017	SAE F 15t	4 BOLT F	1710		
402-0032	SAE B-B 15t	4 BOLT B	DIN 100	1.00 x 1/4	405-0013-02
402-0033	SAE C-C 17t	4 BOLT C	DIN 100	1 1/2 x 3/8	405-0013-03
402-0030	SAE C-C	4 BOLT C	DIN 120		
402-0029	SAE D 13t	4 BOLT D	DIN 100	1 3/4 x 7/16	405-0013-01
402-0026	SAE D 13t	4 BOLT D	DIN 120		
402-0042	SAE D 13t	4 BOLT D	DIN 150	1 3/4 x 7/16	405-0017
402-0040	SAE D 13t	4 BOLT E	DIN 150		
402-0041	SAE C-C 13t	4 BOLT C	Male 11/2 dia w/3/8 key output Pulley mount	N/A	N/A

SUITABLE FOR LOAD GENERATED BY MODERATE LENGTH DRIVE SHAFTS; WITH LONG DRIVE SHAFTS, USE ADDITIONAL SUPPORT

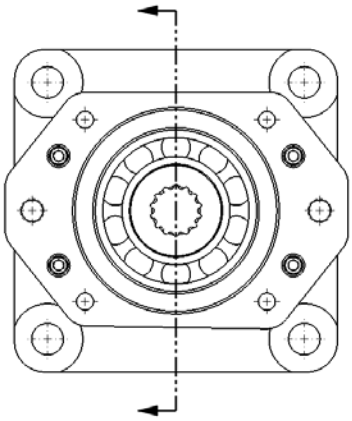


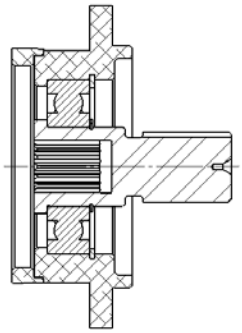


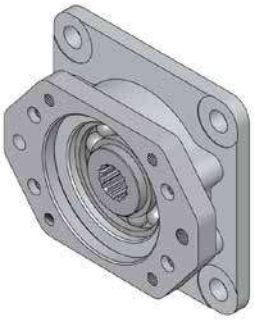
Engine Front Mount
Clutch Accessories

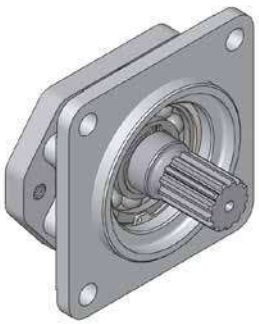
Foot Bracket Matrix

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	076-0653	4 BOLT E
PTO1500/SPF1500	076-0658	4 BOLT F





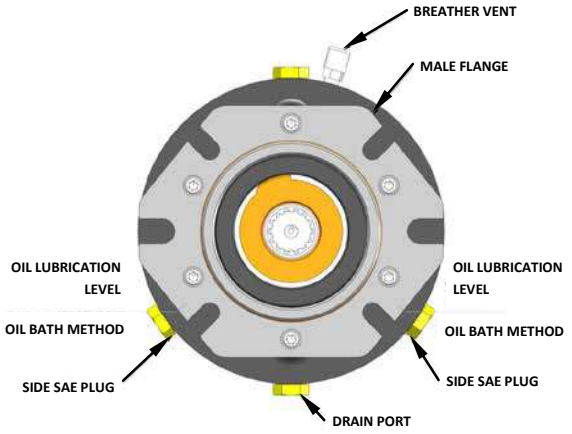


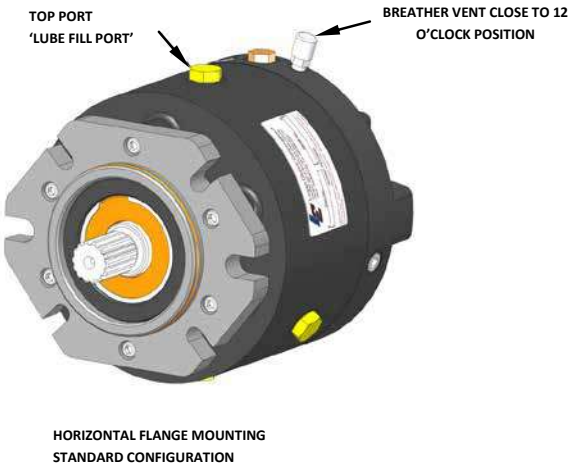


402 Adapter

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

SAE PTO Mounting Options

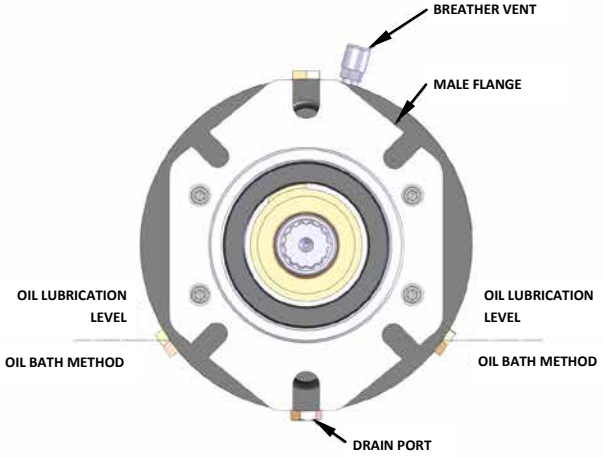




HORIZONTAL FLANGE MOUNTING
STANDARD CONFIGURATION

Figure 1.

OPTIONAL FLANGE ORIENTATION



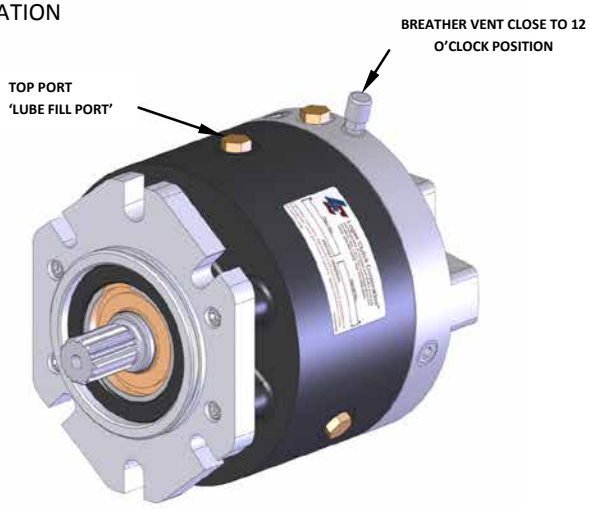


Figure 2.

VERTICAL FLANGE MOUNTING
STANDARD CONFIGURATION

NOTE:
Mounting pitch not to exceed 6° on standard SAE PTO Clutch. Modified standards available for applications exceeding 6° pitch.

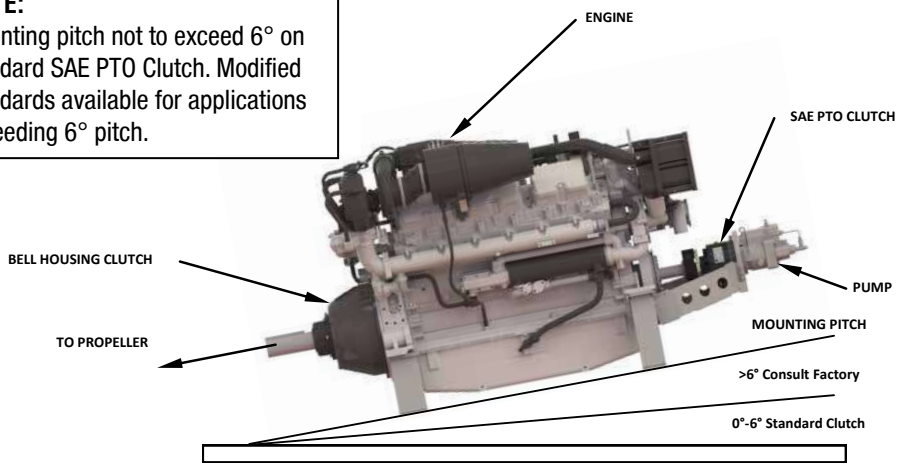


Figure 3.

Figure 4.

IMPORTANT!
LOGAN SAE PTO CLUTCHES CANNOT BE MOUNTED VERTICALLY AS SHOWN IN FIGURE 4, UNLESS FLOW THRU LUBRICATION METHOD IS USED. CONSULT LOGAN CLUTCH ENGINEERING.

Logan SAE PTO Hydraulic Actuation

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.

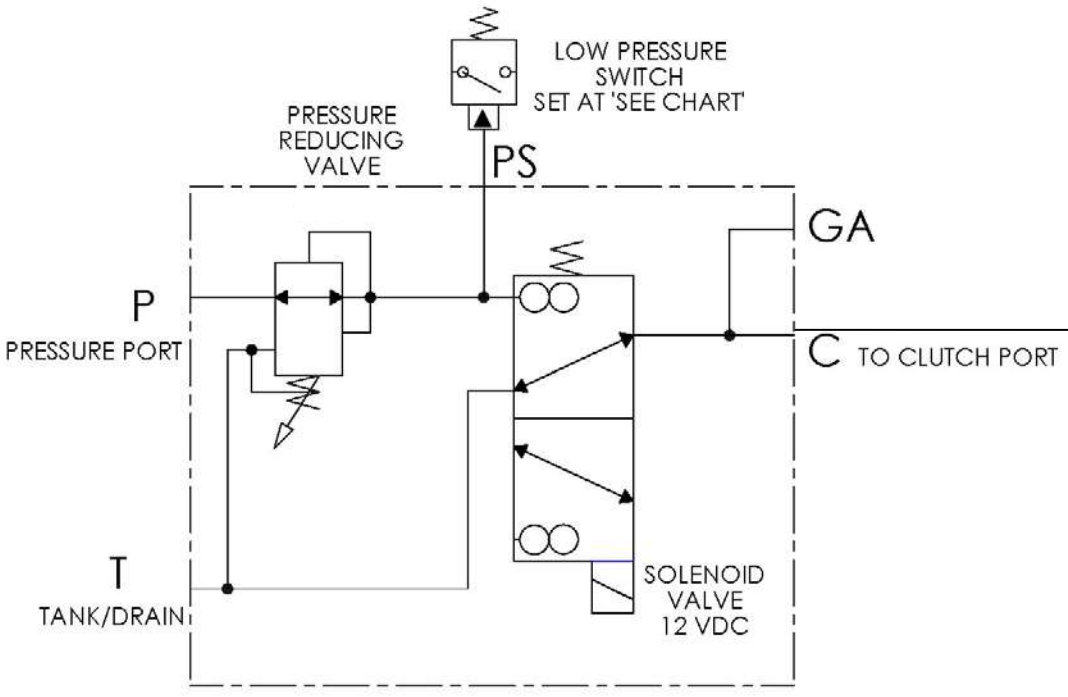
Logan Direct Drive SAE PTO's require an unrestricted port back to tank. It is not recommended to install a filter element on this return line, as any back-pressure exceeding 5 PSI (0.3 bar) will result in poor disengagement and excessive heat and wear.

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.

Hydraulic Valve

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.

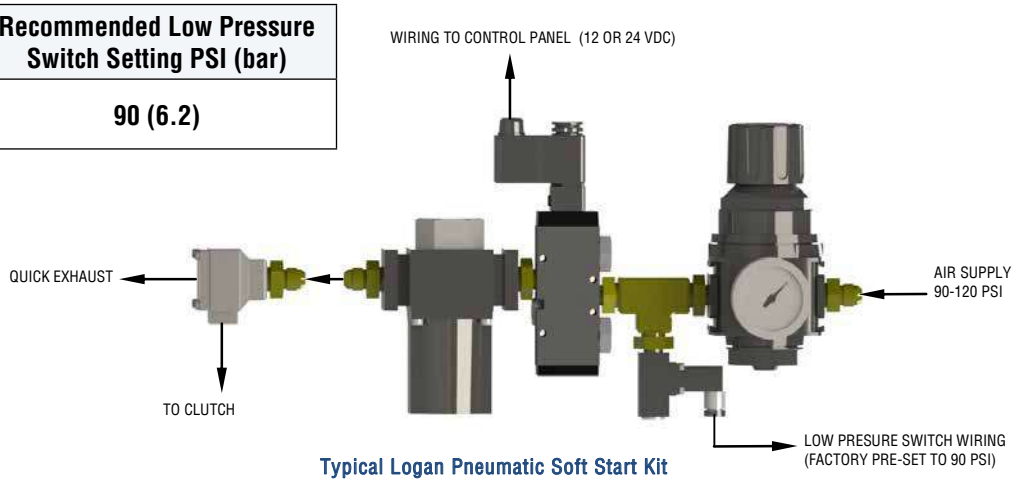
Pressures exceeding 120 psi (8 bar) will cause back plate deflection and premature clutch failure.

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).

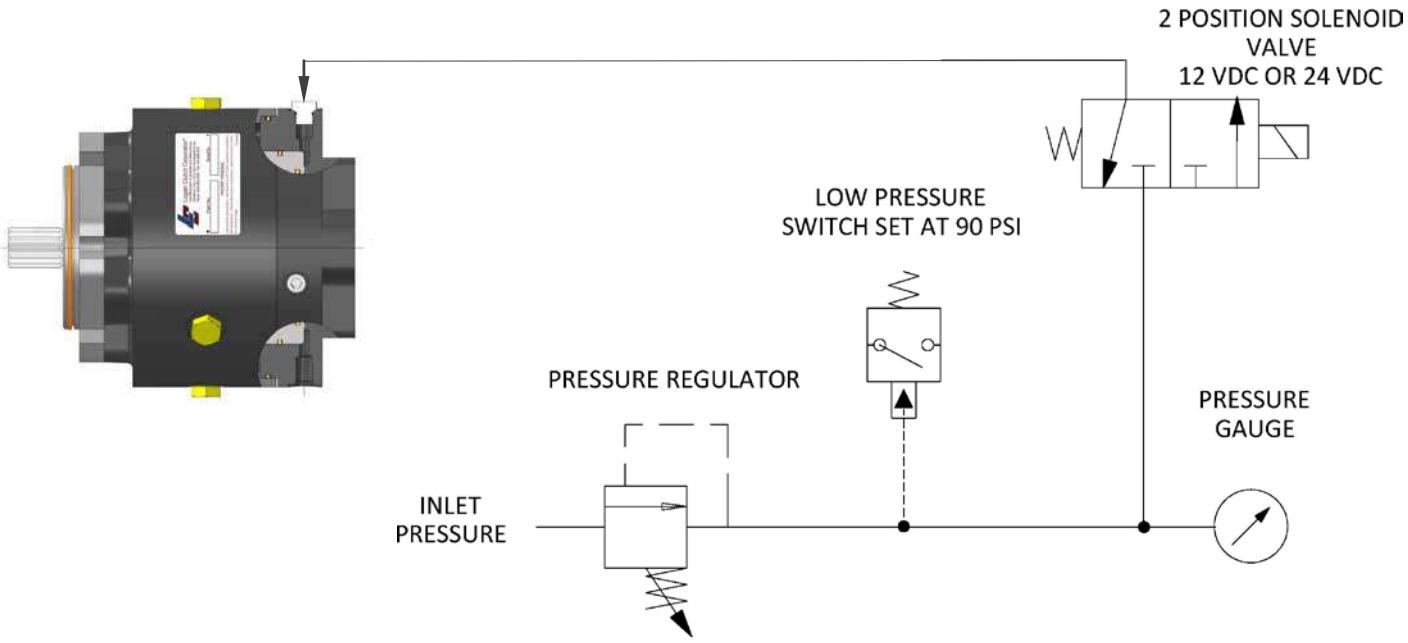
An ATEX option is available.

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



Typical Logan Pneumatic Soft Start Kit

Pneumatic Schematic



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.

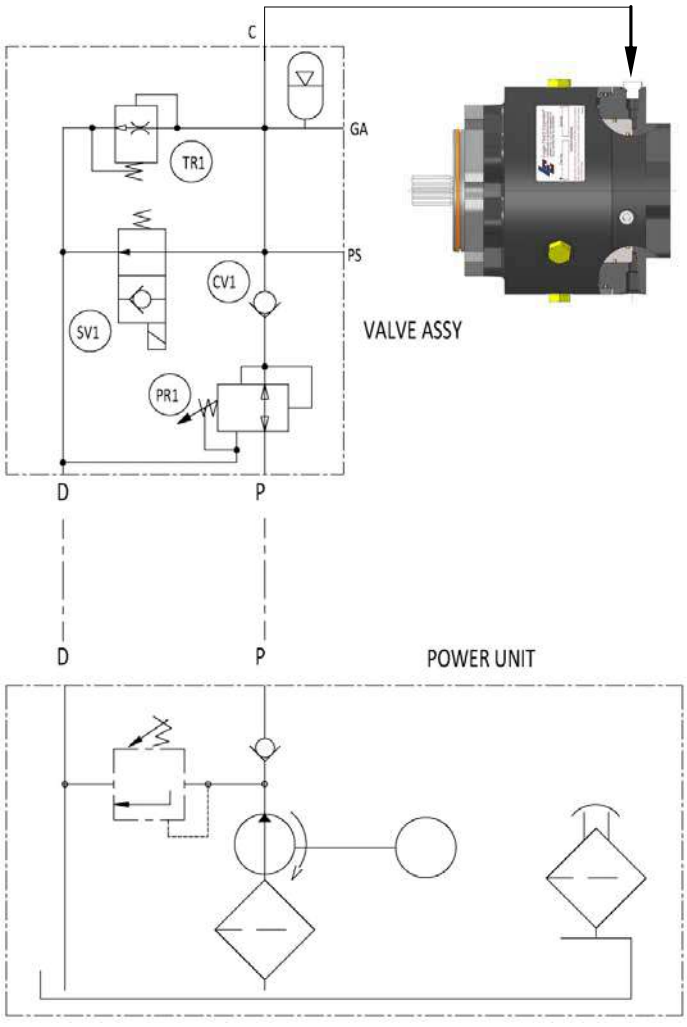
IMPORTANT! **Test ramp-up time at final installation prior to operation. Different ramp-up time may result in clutch failure. Adjust ramp-up time if necessary.**

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.

Logan CH Series Air / Fluid Clutches and Brakes

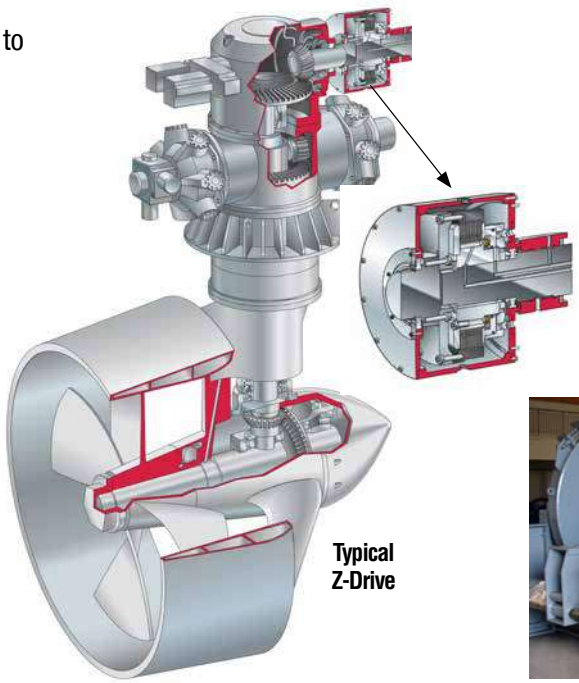
Features:

- Torque Ratings from 49,000 lb-in. (5532 Nm) to 1,280,000 lb-in (144,000 Nm)
- Standard operating speeds up to 2,200 RPM
- Modified Standards to Meet Specific Design Requirements

Advantages:

- High Torque, Small Envelope
- Fluid or Air Actuated
- Wet or Dry Operation
- Smooth Engagement – Quick Release

Logan CH Clutches



Typical Z-Drive

Render-Recover, Ship Assist Winches

Deck and Hawser Winches

Logan Multiple Disc Clutch and Brake Applications

Logan also manufactures and stocks a wide variety of both friction-faced and high-carbon steel discs for wet or dry clutch and brake applications. Logan incorporates the latest technology in sintered bronze facing material.

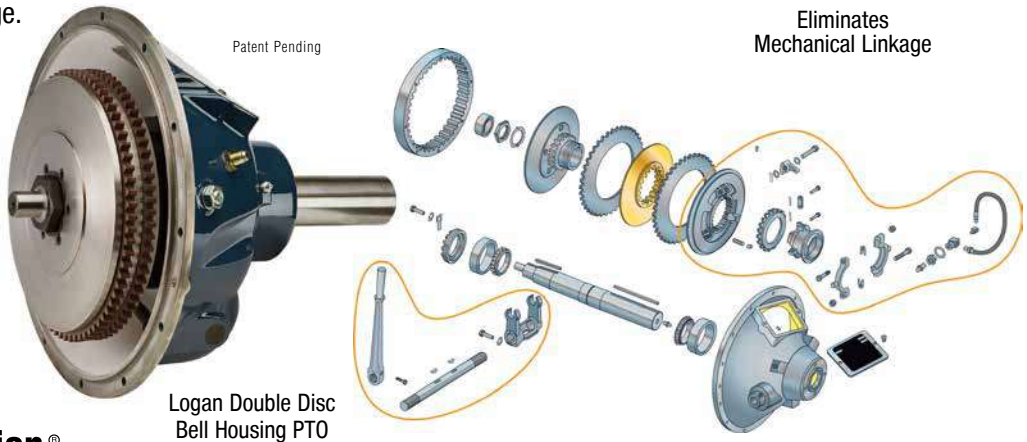
- Reduce tooling costs with existing Logan tooling.
- Improve the quality of your existing friction or steel separator discs with improved friction material coefficients, heat treat specifications and mating disc surface finishes.
- Improved delivery - order small lots from existing Logan disc inventory.

Consider Logan when designing or improving upon your single or multiple-disc clutch or brake application.

Friction-faced and high-carbon steel separator discs

New! Logan Bell Housing PTO Clutches

- Self Adjusting Disc Pack – minimizes Slippage.
- Available with or without pilot boearing.
- Eliminates Mechanical Linkages, Hand Levers, and Yokes.
- Air or Fluid Actuated - (air is ideal for cold start applications).
- Fast Engagement - Quick Release.
- Remote Activation.
- Modified Standards Available.



Logan Double Disc Bell Housing PTO

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