Roadranger®

Eaton® Fuller® Clutches

Application Guide: Medium-Duty Clutches

DANA | EATON

One Great Drivetrain from Two Great Companies

Reliability and long life are certainly two reasons why Eaton Fuller Clutches are the number one selling clutches in North America. Eaton offers a complete line of push and pull type medium-duty clutches with application coverage from 100 to 330 horsepower engines and up to 1150 ft. lb. of torque. This bulletin provides application and adjustment guidelines to assure you the reliability and long life you've come to expect from Eaton Fuller Clutches.

Solo® Adjustment-Free Single and Two Plate Clutches

Solo® Maintenance-Free (Pull Type)

Eaton Fuller Solo Maintenance-Free Clutches are lubed for life to eliminate periodic lubrication and extend clutch service life.

The Solo Maintenance-Free Clutch contains all the benefits of the Standard Solo Adjustment-Free Clutch and its product enhancements maximize service life.

- Roller yoke provides smoother operation and reduced bushing and bearing wear.
- Sealed premium lubed-for-life release bearing eliminates lubrication requirements.
- Improved steel-backed bushings resist wear for increased service life.

Solo® Maintenance-Free

Solo® Adjustment-Free (Pull Type)

Eaton Fuller Solo Adjustment-Free Clutches have been designed to work with either standard or short stroke linkages.

Standard Stroke is normally used with mechanical linkages capable of pulling the release bearing .560"min. (after the yoke is touching the bearing). Additional travel is required for clutch brake squeeze on non-synchronized transmissions.

Short Stroke is used with linkages that have limited stroke (usually hydraulic or cable). Some hydraulic linkages run with the yoke touching the bearing (no free play), and the system must pull the bearing 0.500" minimum. With cable linkage the bearing must be pulled .470" min. after the free play is removed. Additional travel is required for clutch brake squeeze on non-synchronized transmissions.

Adjustment: Pull Type – SAS only (Synchronized Transmissions)

Stamped Angle Spring® (Pull Type)

1. Set the distance between the release bearing and clutch cover at 3/4" (two plate) or 1 3/4" (single plate) (the engine side, not the transmission side).

   Use the internal adjustment to change the gap. Push pedal down and push in and turn the Kwik-Adjust® or remove lock strap to move adjusting ring. Adjuster type depends on clutch model.
2. Adjust the truck linkage to set the distance from the tips of the yoke to the release bearing wear pads at 1/8". The result of setting the 1/8" will vary between truck models and could be from 1" to 3" of "in cab" free pedal.
3. Measure the amount of bearing movement during the pedal stroke—it must be a minimum of 1/2" and not greater than 9/16" to achieve proper release travel.

Adjustment: Push Type – AR only

Angle-Ring® (Push Type)

1. After the truck linkage is hooked up, adjust the linkage to get 1/8" clearance between the bearing and levers. This is the proper linkage setting. Then measure the free pedal in the cab of the truck—this will be the normal "in cab" free pedal for this truck. Adjust the linkage when this dimension reaches one half of normal.
2. Push the pedal to the end of the stroke in the cab. The release bearing should push the levers a minimum of 1/2" to achieve proper release stroke. If less than 1/2" is stroked, the clutch may not release—check truck linkage system if additional stroke is required.

Release bearing / Sleeve length dimensions

310mm clutches have a mounted dimension of 2.062" from the flywheel surface to the lever tips.

350mm clutches have a mounted dimension of 2.438" from the flywheel surface to the lever tips. If the bearing is too far away after the truck linkage is installed and adjusted, investigate and determine if a longer bearing and sleeve assembly is required.

With both the 310mm and 350mm, the release levers will move toward the transmission as the clutch wears by a maximum of 0.75".

SAS = Stamped Angle Spring (Adjustable)	1401 = 14" 1-plate model
AR = Angle Ring	1402 = 14" 2-plate model

INTERNATIONAL (formerly NAVISTAR)

Engine/Truck Model	Spline	Eaton PN	Description	Release Bearing	Max. Torque (lbs.ft.)
(R200, 372, 401, 450, 501)	1-1/4"-10	107605-1	AR 310MM Push Type		400
(BG 241) (C160, 180, 190,	1-1/2"-10	107606-1	AR 310MM Push Type		400
301, 354) (MV-401, 446)					
(V-401, 406, 461, 478, 549)					
(BD100, 308)					
V8 – 266, 304, 345, 392	1-1/4"-10	107605-1	AR 310MM Push Type	3-3/8" (NAV)180155R22	400
				I-2005-C	400
Diesels – 6.9, 354, 462, 550	1-1/4"-10	107605-1	AR 310MM Push Type		400
	1-1/2"-10	107606-1	AR 310MM Push Type		400
7.3 Diesel (Heavy-Duty)	1-1/2"-10	107606-1	AR 310MM Push Type	3-7/8" NAV-487731C91	400
	1-1/2"-10	107621-1	AR 350MM Push Type	1-1/2" NAV-572107C91	500
9 Litre, DT360, T444	1-1/2"-10	107621-1	AR 350MM Push Type	1-1/2" NAV-572107C91	500
DT360, DT408, DT466	1-3/4"-10	107683-5	SAS 1401 Pull Type		620*
VT 365	1-3/4"-10	109400-5	Solo 1401 Pull Type, "Adjustment-Free", Standard Stroke		620*
	1-3/4"-10	109410-5Y	Solo 1401 Pull Type, "Maintenance-Free", Standard Stroke		620
DT408, DT466, DT530	1-3/4"-10	107237-10	SAS 1402 Pull Type		860
	1-3/4"-10	109500-10	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke		860
	1-3/4"-10	109507-10Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke		860
	2"-10	109504-20	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke		1050
	2"-10	109508-11Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke		1150

Do Not Use 107683-5, 109400-5, 109410-5Y, 107237-8, 109500-8 or 109507-8Y in gasoline engines!

CHEVROLET/GMC

Engine/Truck Model	Spline	Eaton PN	Description	Release Bearing	Max. Torque (lbs.ft.)
V8-350, 366	1-1/8"-10	107616-1	AR 310MM Push Type	3-21/32" (FM)GH-2005-C	400
	1-1/2"-10	107616-4	AR 310MM Push Type	2-13/16" (FM)CA02135-C	400
V8-427	1-1/2"-10	107620-3	AR 350MM Push Type	3-1/4" (FM)CA02135-C	500
			(15.5" bolt circle only)	4-1/4" (GM)707696,	
				BG 2255-18	
8.2 Detroit	1-3/4"-10	107620-2	AR 350MM Push Type	3-1/4" FM V614024	500
				4-1/4" BG only 2255-18,	
				(GM)707696	
3116 CAT / 3208 CAT	1-1/2"-10	107620-1	AR 350MM Push Type		500
	1-3/4"-10	107620-2	AR 350MM Push Type		500
3208 CAT / 3116 CAT	1-3/4"-10	107683-5	SAS 1401 Pull Type		620*
CAT 3126, CAT C7		109400-5	Solo 1401 Pull Type, "Adjustment-Free", Standard◊ Stroke		620*
		109410-5Y	Solo 1401 Pull Type, "Maintenance-Free", Standard◊ Stroke		620
	1-3/4"-10	107237-10	SAS 1402 Pull Type		860
		109500-10	Solo 1402 Pull Type, "Adjustment-Free", Standard◊ Stroke		860
		109507-10Y	Solo 1402 Pull Type, "Maintenance-Free", Standard◊ Stroke		860

◊Contact GM Tech Service/Dealer for Linkage Replacement Kit for Standard Stroke Solo.

FORD (F, B, & L SERIES)†

Engine/Truck Model	Spline	Eaton PN	Description	Release Bearing	Max. Torque (lbs.ft.)
GAS V8-330, 361, 370, 391,	1-3/8"-10	107943-3	AR 330MM Push Type	E1HZ7548D/(FM)F-D1757-C	450
429	1-1/2"-10	107943-1	AR 330MM Push Type	E1HZ7548D/(FM)F-D1757-C	450
V8-522(1160 CAT)	1-1/2"-10	107606-1	AR 310MM Push Type 4-3/16"	E1HZ7548A/(FM)FA-02256-C	400
6.6 Ford Diesel	1-1/2"-10	107688-7	SAS 1401 Pull Type	(FS4005 Trans.)	560
8.2 Detroit Diesel, 3208NAT	1-1/2"-10	107621-1	AR 350MM Push Type 3-3/32"	E2HS7548AA/(FM)FE-02256-CA	500
CAT 3208, 6.6 Ford Diesel,	1-3/4"-10	107683-5	SAS 1401 Pull Type		620
Cummins 1060 (5.9L)		109400-5	Solo 1401 Pull Type, "Adjustment-Free", Standard Stroke		620
		109410-5Y	Solo 1401 Pull Type, "Maintenance-Free", Standard Stroke		620
Cummins 1460 (8.3L),	1-3/4"-10	107237-10	SAS 1402 Pull Type		860
7.8 Ford Diesel	1-3/4"-10	109500-10	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke		860
		109507-10Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke		860

† Ford models F-650 and F-750 (began in 1999) have hydraulic clutch linkages, but use Solo Standard-Stroke.

** Previously rated to 680 lb.ft. on trucks built before January 1998.*

FORD (CARGO) SYNCHRONIZED TRANSMISSIONS†

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
6.6 Ford Diesel,	1-3/4"-10	109404-5	Solo 1401 Pull Type, "Adjustment-Free", Short Stroke	620*
1060(5.9) Cummins	1-3/4"-10	109406-5Y	Solo 1401 Pull Type, "Maintenance-Free", Short Stroke	620
7.8 Ford Diesel,	1-3/4"-10	109503-10	Solo 1402 Pull Type, "Adjustment-Free", Short Stroke	860
1460(8.3) Cummins Diesel	1-3/4"-10	109509-22Y	Solo 1402 Pull Type, "Maintenance-Free", Short Stroke	860

NOTE: 1986 Engines do not have dual bolt patterns on the flywheel. Order flywheel #E6HZ6375B (for 6 bolt crankshaft) with EATON FULLER pattern.

† Cargo manufactured by Sterling Trucks after 1997.

FORD (CARGO) NON-SYNCHRONIZED TRANSMISSIONS

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
7.8 Ford Diesel,	1-3/4"	109500-10	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	860
1460(8.3) Cummins	1-3/4"	109507-22Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	860

FREIGHTLINER

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
Cummins, C-8.3, B-5.9	1-1/2"-10	107621-7	AR 350MM Push Type (107621-1 w/ bearing 187140)	500
	2"-10	107342-11	SAS 1402 Pull Type, 2 Plate	860
Mechanical Linkage Only	1-3/4"-10	107683-5	SAS 1401 Pull Type	620*
(Trucks manufactured	1-3/4"-10	109400-5	Solo 1401 Pull Type, "Adjustment-Free", Standard Stroke	620*
after 5/16/94)	1-3/4"-10	109410-5Y	Solo 1401 Pull Type, "Maintenance-Free", Standard Stroke	620
	1-3/4"-10	107237-10	SAS 1402 Pull Type	860
	1-3/4"-10	109500-10	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	860
	1-3/4"-10	109507-10Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	860
	2"-10	109504-10	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	860
	2"-10	109504-20	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	1050
	2"-10	109508-10Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	860
	2"-10	109508-11Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	1150
Hydraulic Linkage Only	1-3/4"-10	109404-5	Solo 1401 Pull Type, "Adjustment-Free", Short Stroke	620*
(Trucks manufactured	1-3/4"-10	109406-5Y	Solo 1401 Pull Type, "Maintenance-Free", Short Stroke	620
before 5/16/94)	1-3/4"-10	109503-10	Solo 1402 Pull Type, "Adjustment-Free", Short Stroke	860
	1-3/4"-10	109509-22Y	Solo 1402 Pull Type, "Maintenance-Free", Short Stroke	860
	2"-10	109505-10	Solo 1402 Pull Type, "Adjustment-Free", Short Stroke	860
Business Class M2	1-3/4"-10	104100-1§	365mm 1-plate Pull Type	520§
(with synchronized trans.	1-3/4"-10	104100-2	365mm 1-plate Pull Type	660
& hydraulic linkage)	1-3/4"-10	104200-1	365mm 2-plate Pull Type	860
Business Class M2	1-3/4"-10	109500-22	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	860
(with non-synchronized trans.	1-3/4"-10	109507-22Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	860
& hydraulic linkage)	2"-10	109504-20	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	1050
	2"-10	109508-11Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	1150

§ For MBE 904 engine.

KENWORTH/PETERBILT

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
Cummins "C" 8.3, "B" 5.9	1-3/4"-10	107683-5*	SAS 1401 Pull Type	620*
Mechanical Linkage Only	1-3/4"-10	107237-10	SAS 1402 Pull Type	860
	2"-10	108334-64	CAST Easy-Pedal 1402 Pull Type (Pot Style Flywheel)	900
	2"-10	109504-10	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	860
	2" -10	109504-20	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	1050
	2"-10	109508-10Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	860
	1-3/4"-10	109400-5	Solo 1401 Pull Type, "Adjustment-Free", Standard Stroke	620*
	1-3/4"-10	109410-5 Y	Solo 1401 Pull Type, "Maintenance-Free", Standard Stroke	620
	1-3/4"-10	109500-10	Solo 1402 Pull Type, "Adjustment-Free", Standard Stroke	860
	1-3/4"-10	109507-10Y	Solo 1402 Pull Type, "Maintenance-Free", Standard Stroke	860
Hydraulic Linkage Only	1-3/4"-10	109404-5	Solo 1401 Pull Type, "Adjustment-Free", Short Stroke	620*
	1-3/4"-10	109406-5Y	Solo 1401 Pull Type, "Maintenance-Free", Short Stroke	620
	1-3/4"-10	109503-10	Solo 1402 Pull Type, "Adjustment-Free", Short Stroke	860
	1-3/4"-10	109509-22Y	Solo 1402 Pull Type, "Maintenance-Free", Short Stroke	860
	2"-10	109505-10	Solo 1402 Pull Type, "Adjustment-Free", Short Stroke	860

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	New		REMAN
REMAN Interchange –	107683-5	=	107213-5MO
	107237-8	=	107137-8MO
(Remaining Numbers –	No REMAN Available)		

ISUZU

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
NPR	1-1/2"-10	107606-7	AR 310MM Push Type	300
FSR, FTR, FVR, FPR	1-1/2"-10	107350-2	AR 350MM Push Type	500
FVR, EVR	1-3/4"-10	107350-7	AR 350MM Push Type	500
	1-3/4"-10	107401-1	SAS 1401 Pull Type (uses 2 plate cover w/1 disc.)	560

HINO

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
FA, FB	1-1/2"-10	107310-1	AR 310MM Push Type	400
FE, FF, SF, FD, GC	1-3/4"-10	107350-1	AR 350MM Push Type	500
145, 165, 185	1-3/4"-10	107350-1	AR 350MM Push Type	500
238, 268, 338	1-3/4"-10	107683-21	SAS 1401 Pull Type	585

MACK (RVI)

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
MS200, MS 250	1-1/2"-10	107350-4	AR 350MM Push Type (Includes Bearing) *Spicer Transmission Only*	500

MITSUBISHI

Engine/Truck Model	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
FK617, FM617, FM657	1-1/2"-10	107351-1	AR 350MM Push Type (14.76 Bolt Circle)	500

1997 & 1998 models only

VOLVO "FE"

(Hydraulic Linkages)	Spline	Eaton PN	Description	Max. Torque (lbs.ft.)
	1-3/4"10	109404-5	Solo 1401 Pull Type, "Adjustment-Free", Short Stroke	620*
	1-3/4"10	109406-5Y	Solo 1401 Pull Type, "Maintenance-Free", Short Stroke	620
	1-3/4"10	109503-10	Solo 1402 Pull Type, "Adjustment-Free", Short Stroke	860
	1-3/4"10	109509-22Y	Solo 1402 Pull Type, "Maintenance-Free", Short Stroke	860
	2"10	109505-10	Solo 1402 Pull Type, "Adjustment-Free", Short Stroke	860

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⚠ WARNING: The major cause of clutch failure is excessive heat. Excessive heat generated between the flywheel, driven discs, intermediate plate and pressure plate can cause the metal to flow and the friction material to be destroyed. If this occurs the clutch can burst which can cause property damage, serious bodily injury or death. In order to prevent clutch failure resulting from excessive heat:

- Recommended vehicle loads should not be exceeded.
- The clutch should only be used for the recommended applications.
- Drivers should be properly trained in the starting, shifting and operation of the vehicle.
- Drivers should report erratic clutch operation as soon as possible to permit maintenance personnel to inspect, adjust or lubricate as required.
- Mechanics must be familiar with proper clutch adjustment, linkage adjustment, lubrication and other maintenance and troubleshooting procedures outlined in the Failure Analysis Guide and the Eaton Fuller Clutch Service Manual.

Eaton Corporation
Clutch Division
201 Brandon Street
Auburn, IN 46706
U.S.A.
www.roadranger.com/clutch

Roadranger®
MORE TIME ON THE ROAD

The Roadranger® System is an unbeatable combination of the best products from Eaton and Dana – partnering to provide you the most advanced, most trouble-free drivetrain in the industry. And it's backed by the Roadrangers – the most experienced, most expert, most accessible drivetrain consultants in the business. Visit our web site at **www.roadranger.com**. For spec'ing or service assistance, call **1-800-826-HELP** (4357) 24 hours a day, 7 days a week, (Mexico: 001-800-826-4357) for more time on the road.

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