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Master cylinder

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Pressure Plate

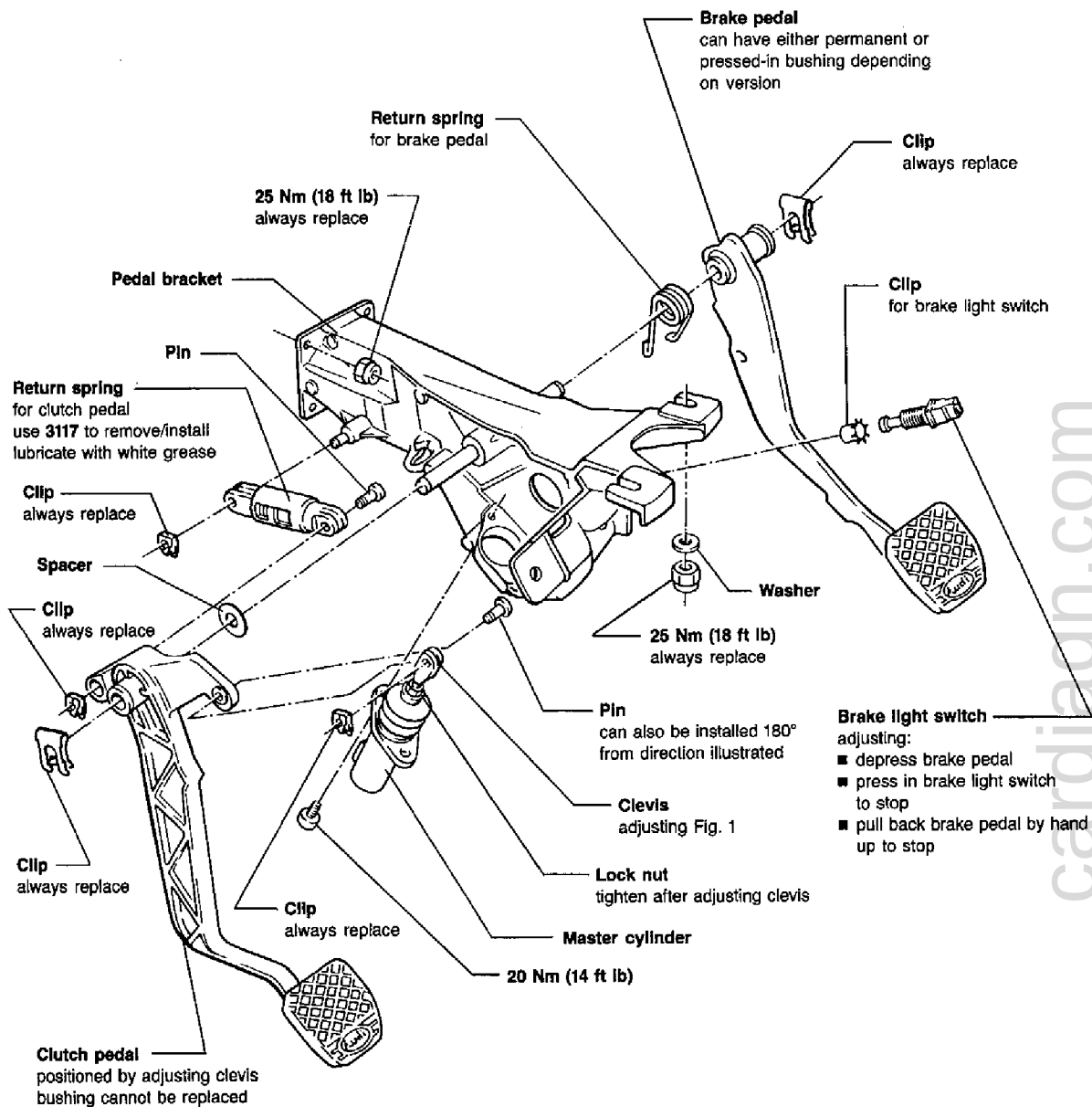
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Note

Lubricate all bushings and contact surfaces before assembly with white lubricating paste, Part No. A0S 126 000 05.

**CAUTION**

Hose for master cylinder must not touch return spring.

Brake pedal travel must not be shortened by excess carpeting.

30-325

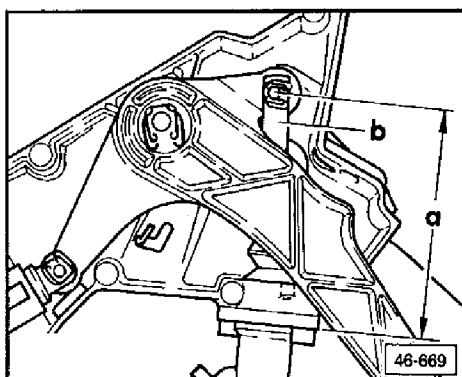


Fig. 1 Clutch master cylinder clevis, adjusting

a = 116.0 + 0.2 mm

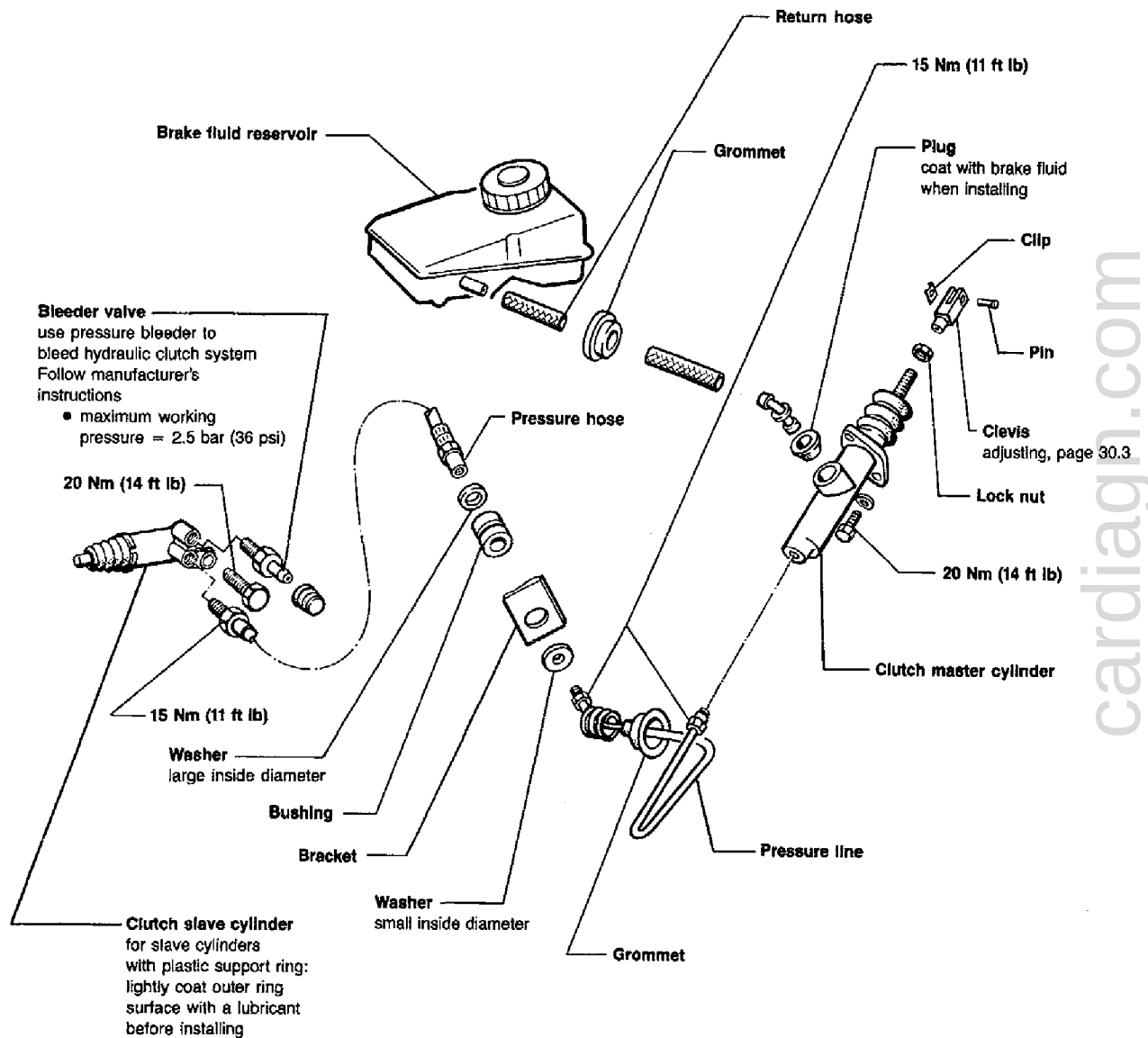
b = clevis

CAUTION

If clutch pedal does not return fully and clevis is correctly adjusted, check for:

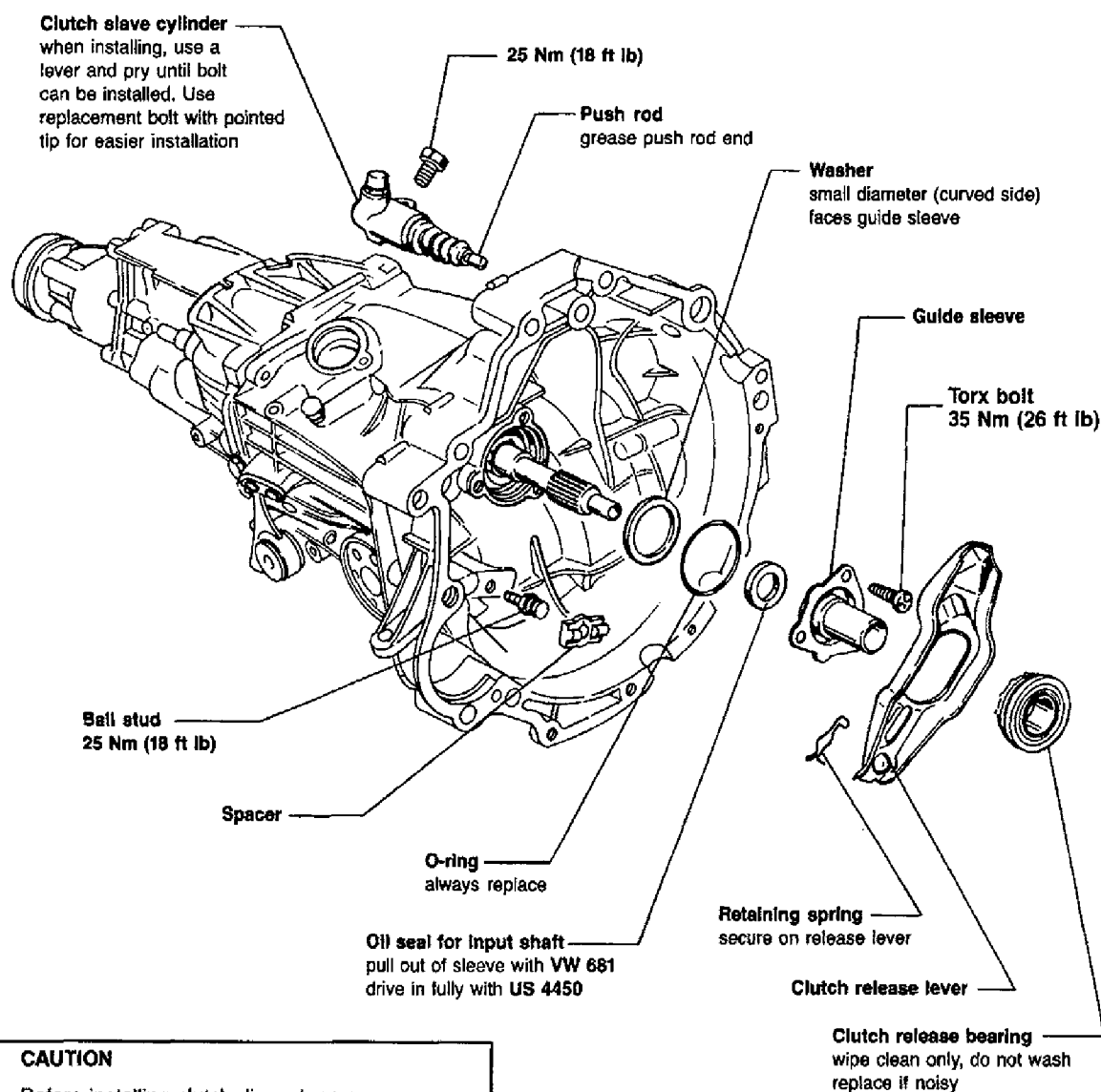
- air in hydraulic system
- restricted movement of pedal at mounting or return spring

Clutch pedal position, at rest, must not contact pedal bracket. Premature clutch wear will result.

**CAUTION**

Do not operate clutch pedal if slave cylinder is removed.

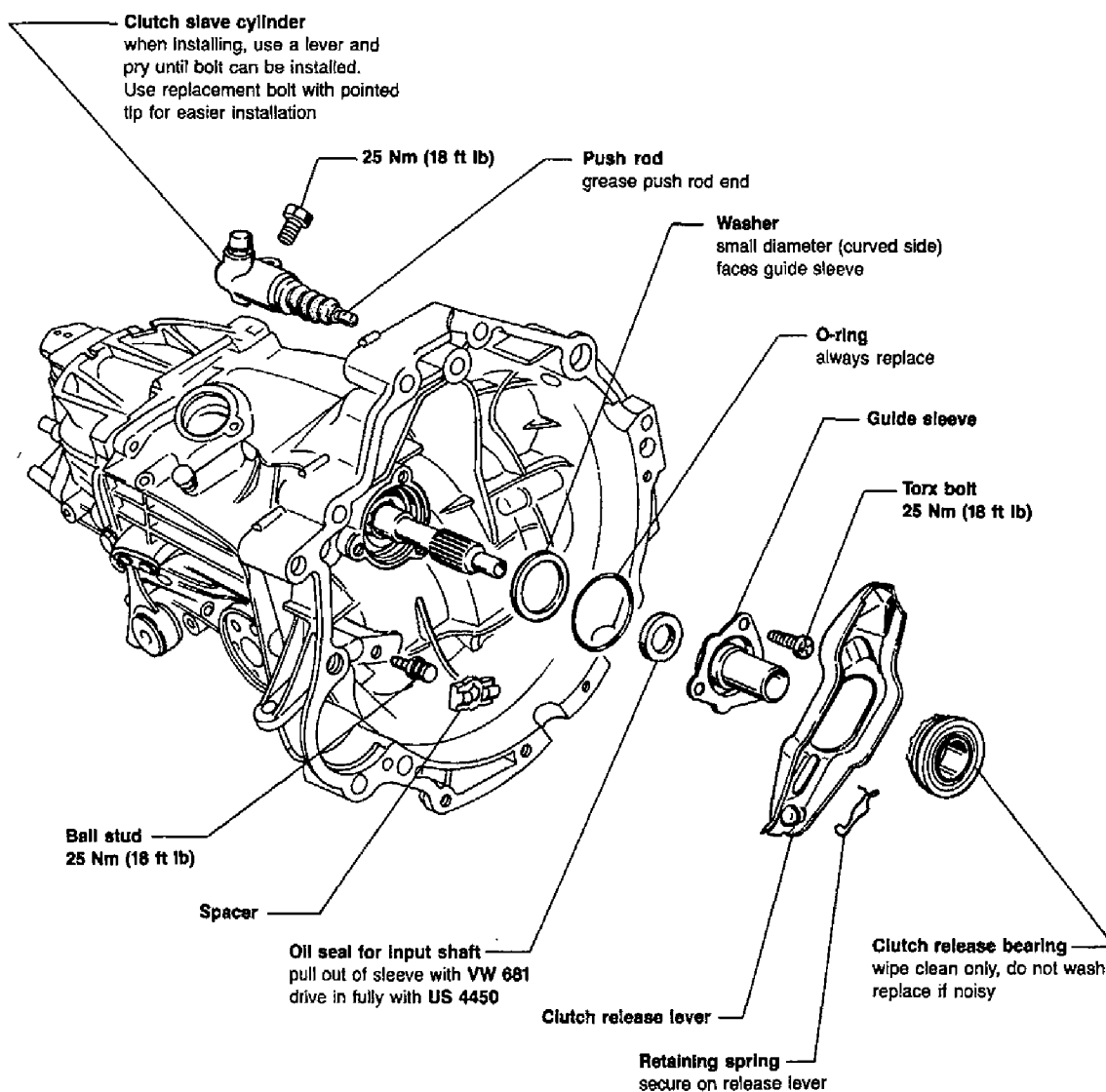
30-329



CAUTION

Before installing clutch disc, clean any corrosion or grease residue, both from input shaft splines, and from hub teeth if disc is to be re-used. Apply extremely light coating of grease, Part No. **G 000 100**, to splines of input shaft only. Place disc on shaft and move back and forth until disc hub slides easily. Remove ALL excess grease.

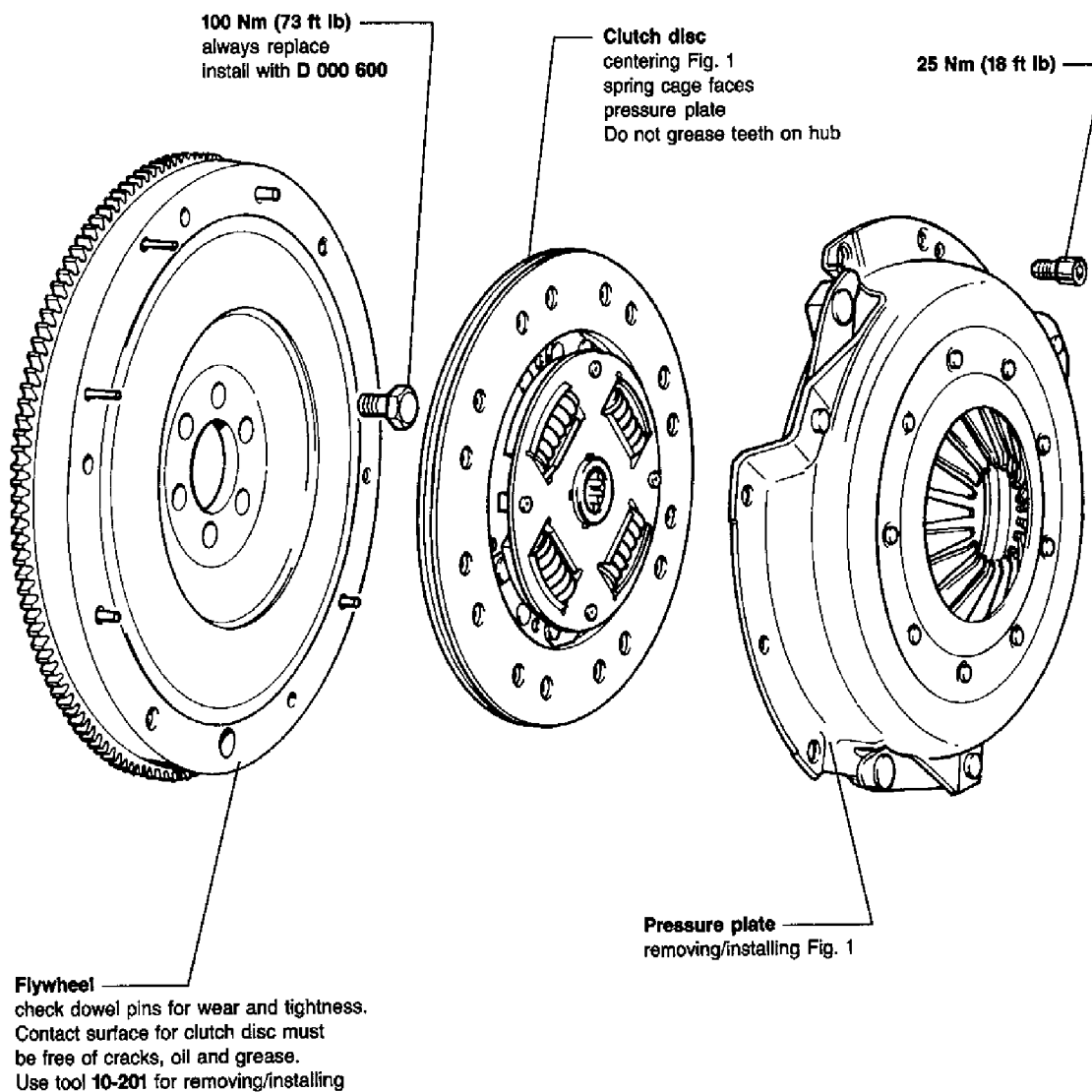
30-295



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Note

Transmission must be removed for clutch repair.



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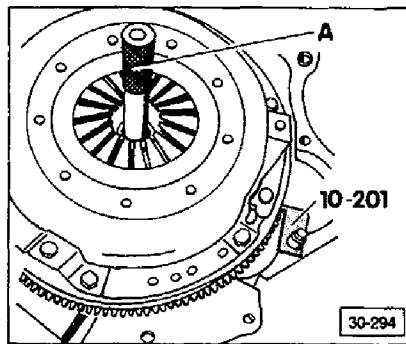


Fig. 1 Clutch, removing/installing

- lock flywheel in position
- loosen/tighten bolts diagonally
 - use pilot tool A = 3176

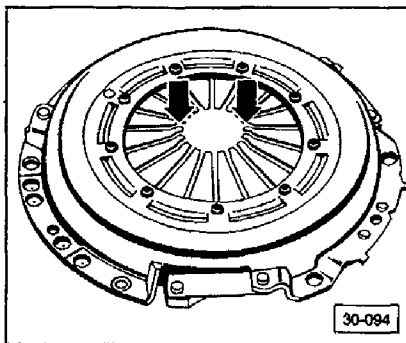


Fig. 2 Clutch diaphragm spring ends, checking

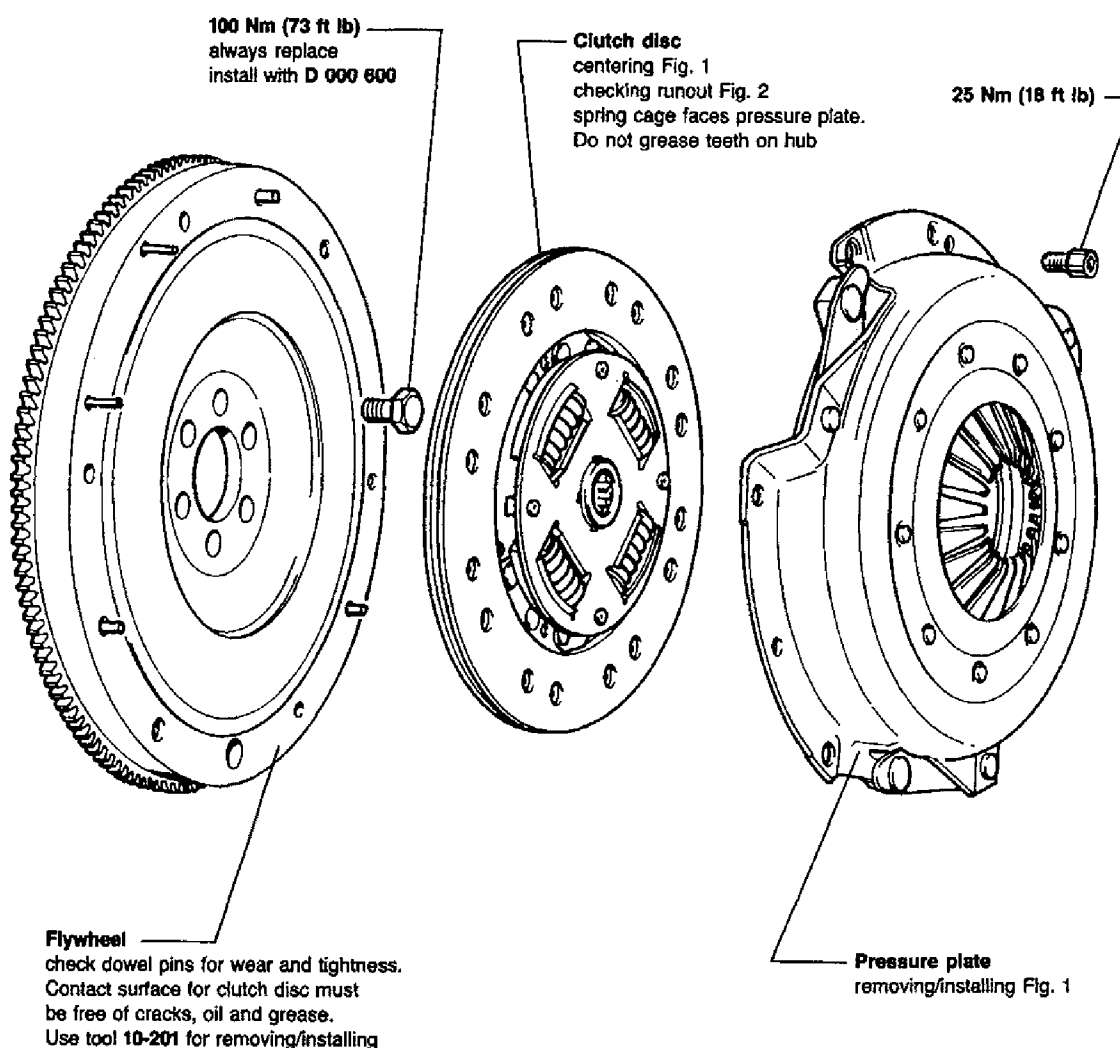
- scores up to a depth of 0.3 mm are acceptable for reuse

CAUTION

When repairing clutch, choose pressure plate and clutch according to engine code letter.

Note

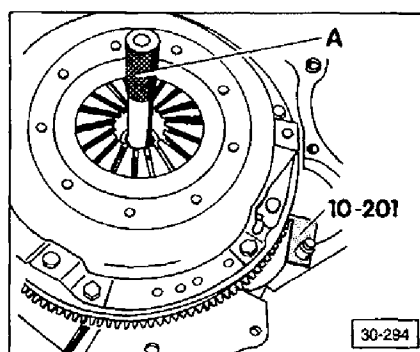
Transmission must be removed for clutch repair.



CAUTION

Before installing clutch disc, clean any corrosion or grease residue from input shaft splines, and also from hub teeth if disc is to be re-used. Apply extremely light coating of grease, Part No. G 000 100, to splines of input shaft only. Place disc on shaft and move back and forth until disc hub slides easily. Remove ALL excess grease.

30-291



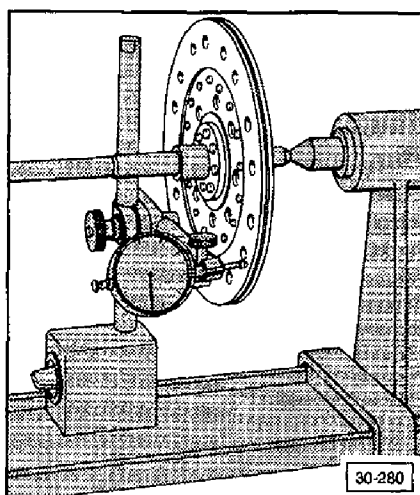
► Fig. 1 Clutch, removing/installing

- lock flywheel in position
- loosen/tighten bolts evenly and diagonally
 - use pilot tool A = 3176

CAUTION

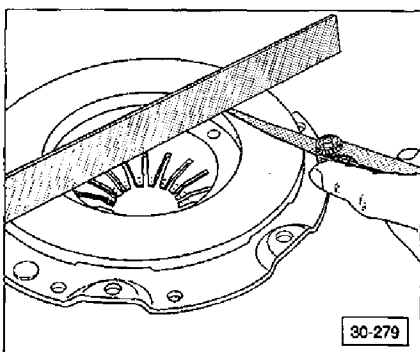
Pressure plate must make complete contact with flywheel before installing the mounting bolts.

Never force pressure plate. Dowel pins/holes could distort.



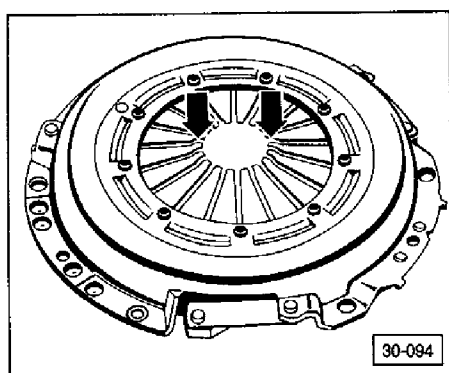
► Fig. 2 Clutch disc, checking runout

- maximum = 0.5 mm
measured 2.5 mm from
outer edge



► Fig. 3 Pressure plate distortion, checking

- maximum = 0.3 mm



► Fig. 4 Clutch diaphragm spring ends, checking

- scores up to a depth of 0.3 mm are acceptable for reuse

CAUTION

When repairing clutch, choose pressure plate and clutch according to engine code letter.

Clutch disc, replacing

Replace clutch disc only if one or more of the following has occurred:

Clutch lining

- worn up to rivet head
- oiled/greased
- burned
- split
- loosened
- cracks/grooves
- damaged rivets

Springs

- rusted solid
- broken
- cracked
- loose

Hub

- rusted
- damaged grooves

Torsion damper

- guide for torsion spring broken
- cover damaged
- torsion spring broken or loose
- grooved
- non-functioning

Pressure plate, replacing

Replace the pressure plate only if one or more of the following has occurred:

Contact surface

- burn marks
- cracks
- distortion
- chatter marks
- grooves
- defective spring
- broken or loose connections

Diaphragm spring

- scores due to wear
- pointed tips
- bent or broken

Housing

- distorted
- broken
- defective spring connections
- bores for dowel pins deformed

Riveted connections

- damaged or loose

CAUTION

Pressure plates are greased and have corrosion protection. Clean only the contact surface, or service life of the pressure plate will be shortened.

Complaint	Possible cause	Corrective action
Clutch pedal does not return to original position (hydraulic clutch)	Air in hydraulic system, brake fluid level too low	Replenish brake fluid; bleed hydraulic system
	Piston seizes in master or slave cylinder	Replace defective part; bleed hydraulic system
	Hydraulic system, or master and slave cylinder leaking	
(mechanical clutch)	Clutch cable hard to operate	Replace clutch cable
	Self-adjusting mechanism (if equipped) defective	Replace clutch cable
(all vehicles)	Return spring (if equipped) defective	Replace return spring
	Clutch pedal hard to operate	Clean pivot points, lubricate. If necessary, replace bushing
	Linkage on transmission hard to operate	Clean pivot points, lubricate. Make necessary repairs
	Mechanical components in clutch housing binding or dragging	Clean pivot points, lubricate. Make necessary repairs
	Clutch release bearing twisted on guide sleeve, seized	Replace guide sleeve and clutch release bearing
	Diaphragm spring of pressure plate broken	Replace pressure plate
Excessively hard clutch pedal (mechanical clutch)	Clutch cable binds or drags. Cable corroded in guide. Self-adjusting mechanism defective (if equipped)	Replace clutch cable
	Linkage on transmission binding or dragging	Clean pivot points, lubricate. Replace bushing
(manual transmission — 020 only)	Pushrod and pressure plate bind or drag	Lubricate contact points lightly with G 000 100 Lightly lubricate clutch pushrod
(all vehicles)	Clutch pedal binding or dragging Note: Prior to checking, disconnect master cylinder and/or clutch cable from clutch pedal	Clean pivot points, lubricate. If necessary, replace bushing
	Over-center spring action drags or binds. Over-center spring defective	Clean pivot points, lubricate. If necessary, replace over-center spring
	Return springs (if equipped) too strong/wrong return spring	Replace with correct return spring

Complaint	Possible cause	Corrective action
Excessively hard clutch pedal (all vehicles) — continued	Clutch release force increased due to wear of clutch linings	Inform customer: release force becomes higher with increasing wear Replace clutch disc if lining/rivet distance is below 0.1 mm
	Mechanical components in clutch housing bind or drag	Clean pivot points, lubricate. If necessary, replace pivot bushings
	Release bearing twisted on guide sleeve, seized	Replace defective parts
	Contact surface release bearing/release lever worn	Replace defective parts
	Pressure plate with wrong spring	Replace with correct part no.
	Clutch disc binds or drags on gears	Check gears of hub for defects (burrs). If necessary, replace clutch disc. Clean corrosion and lubricant from gears of hub and input shaft. Lubricate input shaft splines with extremely light coating of grease, G 000 100 . Move clutch disc back and forth; remove surplus grease.

Complaint	Possible cause	Corrective action
Clutch slips; little or no clutch action (hydraulic clutch)	Master/slave cylinder piston does not return to rest position.	Replace master/slave cylinder. Change brake fluid, bleed system.
	Clutch cable improperly adjusted (insufficient clutch free play). Wrong clutch cable	Correct adjustment. Replace with correct cable, if necessary
	Self-adjusting mechanism (if equipped) defective	Replace clutch cable, if necessary
(mechanical clutch)	Clutch cable binds or drags	Replace clutch cable, if necessary
	Clutch release pushrod oil seal in input shaft leaks	Replace oil seal, clutch disc. Clean pressure plate and flywheel
(manual transmission — 020 only)		
(all vehicles)	Wrong clutch disc, wrong pressure plate installed	Replace with correct clutch disc or pressure plate
	Clutch disc worn, burnt pressure plate, overheated grooves, pressure plate distorted due to wrong installation, pressing force of pressure plate too low. Driving errors, normal wear	Replace clutch disc, pressure plate. Instruct customer
	Mechanical components of transmission drag, pedal linkage binds	Clean pivot points, lubricate; repair if necessary
	Clutch disc, pressure plate, flywheel oil-contaminated. Crankshaft oil seal defective. Grease on contact surfaces from over-lubrication of hub	Replace clutch disc. Clean contact surfaces of pressure plate and flywheel. Replace crankshaft oil seal, remove surplus grease from input shaft
	Clutch disc installed from wrong side	Correct installation. Check clutch disc; replace if necessary
	Flywheel too thick; excessive wear on contact surfaces	Replace with correct flywheel. Check disc and pressure plate; replace if necessary

Complaint	Possible cause	Corrective action
Grinding noises when engaging a forward or the reverse gear, shift mechanism binds, drags; shifting not possible, clutch inoperative (hydraulic clutch)	Brake fluid level too low	Check system. Replenish brake fluid, bleed system
	Air in system; clutch does not disengage completely	
	Master/slave cylinder leaking, aged, line is too elastic	Replace defective part. Replenish brake fluid, bleed system
	Adjustment of clevis not correct	Correct adjustment
(mechanical clutch)	Mechanical components misaligned	Replace mechanical components
	Clutch free play excessive	Check clutch free play, adjust if necessary
	Wrong clutch cable installed (too long)	Replace with correct clutch cable
	Clutch cable defective; binds or drags	Replace clutch cable
	Self-adjusting mechanism (if equipped) defective	
(manual transmission — 020 only)	Pushrod too short due to wear	Replace pushrod, check release bearing. Lightly lubricate pushrod/release bearing contact points with G 000 100 grease
(all vehicles)	Clutch pedal travel insufficient (carpet, floor mat beneath pedal). Clutch not being fully depressed	Inform customer
	Only reverse gear grinds when engaged	Inform customer. Depending on clutch diameter, wait approximately 3-6 seconds after depressing clutch before engaging reverse gear. Input shaft with clutch disc must first come to a stop
	Adjustment of shifting mechanism	Check, correct if necessary
	Bearing for shift lever and shift operation not lubricated; misaligned	Lubricate shift mechanism, replace defective parts

Complaint	Possible cause	Corrective action
Grinding noises when engaging a forward or the reverse gear, shift mechanism binds, drags; shifting not possible, clutch inoperative (all vehicles) — continued	Clutch disc binds or drags on gears. Hub corroded, or was damaged during installation. Hub misaligned on one side	Check gears of hub for damage, replace clutch disc if necessary. Remove corrosion and grease residue from hub and shaft. Grease input shaft splines with extremely light coating of G 000 100 . Move clutch disc back and forth; remove surplus grease. When hub is misaligned, check position of adaptor sleeves. Check release bearing, guide sleeve, pressure plate and pilot bearing. Replace if necessary
	Pressure plate lift-off too slight (wrong pressure plate installed)	Replace with correct pressure plate
	Pilot bearing on crankshaft defective. Input shaft still driven when clutch disengaged	Replace pilot bearing and lubricate with MoS ₂ . Check adaptor sleeves. Replace if necessary. Check shaft
	Engine/transmission offset too large (adaptor sleeves missing), thus support plate of clutch disc bent	Install adaptor sleeves prior to transmission installation. Check clutch disc, pressure plate and pilot bearing (if equipped) for damage; replace if necessary
	Pilot bearing in crankshaft defective	
	Lining worn due to excessive rpms: down-shifting at too fast a speed	Replace clutch disc; inform customer
	Lining worn from riding the clutch when accelerating	
	Synchronizing system and/or shifting mechanism in transmission defective	Repair transmission

Complaint	Possible cause	Corrective action
Grinding noises when engaging a forward or the reverse gear, shift mechanism binds, drags; shifting not possible, clutch inoperative (all vehicles) — continued	Pressure plate uneven due to wrong installation. Clutch disc distorted due to improper handling	Check parts, replace if necessary. Observe position of locating pins If grinding occurs thereafter, check splines on clutch disc hub and shaft for ease of operation, check pilot bearing (if equipped) in crankshaft. If necessary, repair transmission
	2nd gear grinds only when cold	Inform customer. If necessary, replace transmission oil with oil of different viscosity (see specs/ procedures in this manual)
	Diaphragm spring tips broken or bent (installation error: release bearing runs off center)	Replace pressure plate. Check guide sleeve; replace if necessary. Check adaptor sleeves
	Clutch disc too thick	Replace with correct clutch disc
	Lining rusted onto flywheel (long periods of disuse, high relative humidity)	Lightly sand friction surfaces. Replace parts when corrosion is severe

Complaint	Possible cause	Corrective action
Noises during clutch operation (mechanical clutch)	Transmission noises enter passenger compartment via clutch cable	Replace or add insulating components as necessary
	Clutch cable creaks, binds or drags	Replace clutch cable
	On full pedal application, diaphragm spring rubs against clutch disc (insufficient clutch free play)	Adjust clutch free play
	Self-adjusting mechanism (if equipped) defective	Replace clutch cable
	Release plate contact points and diaphragm spring need lubricating	Lightly grease contact points with G 000 100 . Replace worn parts.
(manual transmission — 020 only)	Contact points, pushrod, release plate need lubricating	Lightly grease contact points with G 000 100
(all vehicles)	Clutch pedal binds or drags/ pivot points misaligned	Clean pivot points, lubricate. If necessary, replace bushing
	Pivot of over-center spring dry, dragging, misaligned	
	Return spring (if equipped) noisy	Lubricate pivot points
	Release bearing or release bearing guide defective, contact surface worn (shrunk?)	Generally, replace noisy release bearing. Replace damaged guide sleeves
	Contact surface (diaphragm spring tips) of pressure plate defective (bent, broken). Release bearing off-center in contact area	Replace pressure plate. Check release bearing and guide sleeve; replace if necessary. Check adaptor sleeves.
	Pilot bearing (if equipped) in crankshaft defective, engine/ transmission offset from center	Replace, lubricate with MoS ₂ grease. Check adaptor sleeves
	Clutch disc installed improperly	Correct installation
	Wrong clutch disc installed	Replace with correct clutch disc

Complaint	Possible cause	Corrective action
Clutch pulls, power train rattles (hydraulic clutch)	Adjustment on clevis not correct	Correct adjustment
	Air in the system; master cylinder/slave cylinder defective	Replace defective part. Check brake fluid level, bleed system, check for leaks
(mechanical clutch)	Master cylinder/slave cylinder pushrod does not return to rest position	Replace defective part. Change brake fluid, if necessary. Bleed system
	Clutch cable binding	Replace clutch cable
	Clutch pedal binding Note: Prior to checking, disconnect clutch pedal from clutch cable.	Clean pivot points, lubricate if necessary. Replace bushing if necessary
	Linkage on transmission binds or drags	Clean pivot points, lubricate. Replace bushing if necessary
(all vehicles)	Engine runs unevenly	Check engine adjustment; correct if necessary
	Driving errors: acceleration rpm too low	Instruct customer
	Wrong clutch disc installed	Replace with correct clutch disc
Noises in idle (manual transmission — 020 only)	Clutch lining, contact surface of pressure plate and flywheel oil-contaminated (oil seeps out of clutch housing)	Check clutch release pushrod oil seal; replace if necessary. Replace clutch disc; clean pressure plate and flywheel
(all vehicles)	Torsion spring broken	Replace clutch disc
	Clutch disc installed without spring cage (rattling in idle)	Install clutch disc with spring cage
	Pressure plate distorted, broken, out-of-round	Replace pressure plate
	Engine runs unevenly	Check engine adjustment; correct if necessary

Complaint	Possible cause	Corrective action
Noises in idle (all vehicles) — continued	Engine mounts are too “soft”; misaligned	Check contact points. Replace if necessary, with correct engine mounts
	Shock absorbers defective	Replace shock absorbers
	Clutch lining, contact surface of pressure plate and flywheel oil-contaminated	Locate cause of contamination; repair as necessary. Replace clutch disc; clean pressure plate and flywheel
	Release bearing twisted on guide sleeve, seized (presses from one side on diaphragm spring of the pressure plate)	Replace release bearing and guide sleeve. Check mechanical components and pivot points
	Contact surface of pressure plate has lift on one side only, due to twisted release bearing	Check contact surface for clutch lining on flywheel pressure plate and diaphragm spring; if necessary replace pressure plate. Replace release bearing and guide sleeve.
	Housing of pressure plate warped during assembly. Contact surface of pressure plate has lift on one side only	
	Input shaft greased excessively (traces of grease on clutch disc, pressure plate and flywheel)	Clean grease from pressure plate and flywheel. Replace if damaged (i.e., scoring, signs of overheating, grooves). Remove all lubricant from hub and input shaft, lubricate input shaft lightly with G 000 100 . Move clutch disc back and forth; remove excess grease.